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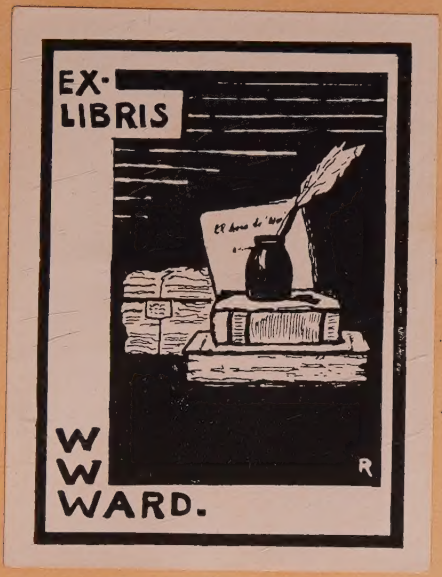

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GOVERNMENT OWNERSHIP
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OPERATION OF RAILROADS

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GOVERNMENT OWNERSHIP AND OPERATION OF RAILROADS

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BY
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TO MY MOTHER,

MARY MARSHALL COLLINS SPLAWN

PREFACE

THIS book is written for thoughtful and intelligent citizens. No technical training is required to understand it. No effort has been made at journalistic writing. The reader is not offered entertainment. While the style adopted is not lively, it is hoped that it will not discourage the reader. The book is written to inform and to provoke thought.

In a time when there is rather universal satisfaction with the existing arrangements for operating railroads in the United States and when there is very little general interest in railway problems, one may inquire why a book on this subject should be written. One eminent economist advised the author to hold the manuscript and publish it when there may again be agitation for government operation of the railroads. The answer to that suggestion is that when there is agitation, campaigning, excitement, and when all sorts of people are writing and talking with animation and partisanship, it is next to impossible for one to be heard who would speak dispassionately and address his remarks to reason. The author prefers the quiet of the reading room to the mêlée of the mob. Moreover, he believes that the majority is less likely to be unduly excited or to go wrong when stirred, if in advance some shall have informed themselves and shall have done a little thinking.

Too many have contributed toward what is here submitted, for personal mention in each case to be practical. It would be pleasant to call by name the technicians who

have aided with translations from reports in foreign languages, in compiling and checking statistics from many sources, in drawing maps from data submitted, and others who have read portions or all of the manuscript. Acknowledgment must be made of the Grant to the University of Texas by the Laura Spellman Rockefeller Memorial Foundation which made this study possible. The author is under lasting obligation to the staff of the Library of the Bureau of Railway Economics for unfailing courtesies and assistance both in assembling and in furnishing data. Mrs. Margaret Keister White, Research Assistant in Economics at the University of Texas, has toiled laboriously and efficiently at a hundred tasks. She has also read the manuscript.

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GOVERNMENT OWNERSHIP
AND
OPERATION OF RAILROADS

GOVERNMENT OWNERSHIP AND OPERATION OF RAILROADS

CHAPTER I

INTRODUCTION

In a society where practically all business was on a small scale, where investments of capital were not so great as to give a going concern the advantage of monopoly, competition served to regulate prices so that the consumer, it was believed, did not pay much more than the costs of production. Within such costs were included such profits as might be necessary to keep people interested in carrying on business. The English Economist, Adam Smith, in 1776 published his great book entitled the "Wealth of Nations," in which he attacked the policy of regulation of business activities by the Government, and argued most convincingly that better quality of goods could be had at lower prices, if business men were left alone to be regulated by competition among themselves. Within the fifty years following the publication of the "Wealth of Nations," Adam Smith's ideas came to be rather generally accepted in English-speaking countries.

During the time that men were coming to believe that unregulated competition would best serve to regulate business, the nature of business undertakings was undergoing revolutionary changes by reason of a large

number of highly important inventions. Manufacturing for most part ceased to be a handicraft and became a machine process. Vast investments of capital were created. Capital became relatively of increasing importance in any business process. This new capital greatly increased the productivity of labor; it made production a roundabout process—complicated instead of simple; it encouraged the production of goods in anticipation of demand instead of merely making them to order. These changes brought great specialization, necessity for the corporate organization, and production for what is called a world market.

After the middle of the nineteenth century, Englishmen and Americans began to realize that many business enterprises required such vast investments of capital that after they were established it was in many cases either undesirable or impracticable to create a competing organization. Such enterprises had to be accepted as monopolistic in character. If it were not economical or desirable to duplicate investments and organization where one organization could meet the needs of consumers, obviously competition could not be relied upon to regulate where competition might be impossible, undesirable, or greatly limited in its scope.

Eventually it was realized that railroads are monopolistic in character. It costs many thousands of dollars per mile to construct and to equip a railroad. If one railroad will serve its territory, a duplication, in order to have parallel and competing facilities, would be waste. Before this truth was fully comprehended there was much wasteful duplication both in England and in America. Happily the railway industry was in its period of beginnings, when the practice of duplication was at its worst. The development of business, the great increase

in the quantities of tonnage to be moved, in most instances, served to correct what otherwise would have been disastrous errors. By reason of developing the railway industry as a competitive business, the systems that have gradually evolved not only compete with other means of transportation, but among themselves. The effort has been made to regulate railroads so that their charges may not be too high or unfair to the patrons of the railroads on the one hand nor ruinous by reason of cutthroat competition on the other hand. More and more the rates are subjected to the closest public scrutiny, and the effort is made to confine competition to the service offered.

A group of thinkers have held that business enterprise so large as to be monopolistic in character cannot be successfully regulated. They believe that the only solution is what is termed state socialism. The Socialists have developed quite a following, having many adherents to fractions of their program among people who would scorn to be classed as Socialists. The Socialists and a larger group who refuse to accept the socialistic philosophy but who are attracted by certain fragments of the socialistic program, believe that the railroads should be owned and operated by the State. They are wont to support their contentions by citing the relatively large mileage now owned and operated by various governments.

There are others who know very little about the philosophy of socialism and who might have no sympathy with socialism, if they understood it, who for one reason or another favor government ownership and operation. Some among the employees of privately operated companies think their wages would be increased if the railway properties were transferred to the Government. Some shippers think rates might be reduced. Some have grievances which, in their opinion, call for a change to public

ownership and management. In times when the railroads are subjected to unusual stress and strain, grievances tend to multiply, and millions of people who know noth-

STATE RAILWAY OWNERSHIP

Principal Countries and Totals for Continents

	Year	Total Railway Mileage	State Railways
Algiers and Tunis	1922	4,210	1,799
Argentina	1923	22,228	3,985
Austria	1922	4,274	2,964
Belgium	1923	6,956 [a]	2,759
Brazil	1923	18,703	14,948
British Isles	1924	23,339	.....
Bulgaria	1923	1,635	1,635
Canada	1923	40,094	20,523
Chili	1923	5,642	3,133
China	1922	6,822	4,001
Czechoslovakia	1922	8,714	5,305
Denmark	1922	2,662	1,283
Dutch Indies	1922	1,878	1,554
Egypt and Sudan	1922	4,883	2,335
Finland	1923	2,770	2,584
France	1922	33,208	5,586
Germany	1922	35,558	32,785
Greece	1924	1,470	795
Hungary	1922	5,327	1,877
British India	1924	40,401	37,029
Italy	1922	12,473	9,747
Japan	1923	10,632	6,722
Jugoslavia	1923	5,696	4,722
Luxemburg	1923	334	122
Mexico	1922	16,406	12,795
Netherlands	1923	2,392	.....
Norway	1923	2,148	1,877
Peru	1923	2,077	1,100
Poland	1923	10,312	9,850
Portugal	1923	2,124	843
Roumania	1923	7,246	7,246
Russia and Siberia	1922	30,732	24,509
Southwest Africa (formerly German Territory)	1924	1,304	967
Spain	1923	9,504	.....
Sweden	1924	9,548	3,487
Switzerland	1923	3,422	3,422
Turkey in Europe	1923	257	.....
Union of South Africa	1924	11,679	11,113
United States	1923	250,282	.....
Europe	1923	227,581	123,398
North and South America	1923	369,839	57,302
Asia	1923	75,894	57,353
Africa	1923	33,783	16,214
Australasia	1923	29,540	25,454

[a] Including local railways.

Source: English "Railway Year Book," 1926, August 12, 1927.

ing about the railway business are influenced by the gossip in the newspapers, and by representations of candidates for high office. At such a time a relatively trivial

incident may be magnified out of all proportion to its importance, for some cause the people may become irritated and impatient. With the public in such a frame of mind, a few adroit politicians might lead them to adopt some radical and far-reaching policy—such as a change from private to government operation of the railroads.

Looking to such a possibility, and with the hope of making it easier for men to form opinions based upon facts and to act in accordance with reason and not from emotional excitement, an effort should be made to submit a discussion of government ownership and operation of railroads which would give desired information, provoke thought, and be as free from prejudice as it is possible for a mere human being to divest himself of bias.

Since the American people have from choice developed their railway system under private ownership and operation, they should be convinced that the change is necessary and advantageous before committing themselves to government ownership and operation.

In making a survey of experience in different countries more has been learned about conditions in some places than in others. It is as though one were traveling from country to country. On such a journey more definite impressions would be obtained of some localities than of others. Opportunities for observation would be greater among some peoples than among others. So in investigating railway transportation the world around, a wealth of dependable material is found in some instances, while elsewhere scarcely anything is available. The result is that the following presentation is necessarily uneven, sometimes quite sketchy or patchy. Thanks to questionnaires sent through commercial attachés, and to official reports and special articles in reputable publications, statistics have been assembled, with reference to a few

important items, on the railroads of almost every country. But one will make comparisons at one's peril. The conditions are so different from one country to another that the figures do not tell the same story in each instance. Moreover, it will be seen, as in the case of India, that there are quite a variety of arrangements under the headings, government ownership and government operation. These phrases do not mean the same thing in every case. Operating conditions and results may be very different in some country from what they are in America, so much so that one might think the American railroads quite superior. Yet a little attention might reveal that what by comparison had appeared inferior was really not comparable, and quite adequate and efficient in the particular locality with its own peculiar conditions. One cannot take the statistics given in the official reports and by them prove a case either for or against government ownership and operation of railroads.

The following pages serve to reveal that the people of the United States cannot look to foreign experience to guide them in shaping their policies with reference to ownership and management of railroads. A little inquiry shows that private ownership and management of railroads in the United States was consciously adopted after considerable experience with state ownership and operation of canals. The account of the growth and the performance of railroads in this country is submitted as a statement of facts. The reader may draw his own conclusions from the character, dependability, quality, and cost of American railway service. In the closing chapters, some arguments which are advanced from time to time in favor of government ownership and operation of railroads are stated and discussed. This is done neither in the spirit of controversy nor with a view to convincing

any one. It is done in order to disclose clearly what issues are involved in a proposal to change over from private to government management, and to point out what should be demonstrated before such a change is contemplated.

CHAPTER II

SMALL COUNTRIES OF WESTERN EUROPE

SCANDINAVIA

One would not expect railway construction in Scandinavian countries to be particularly attractive to private capital on account of the competition of navigable waterways that accommodate those countries.

Sweden

In Sweden the lakes are supplemented by the Göta and the Trolhathan canals. The lakes and the canals together form a continuous chain of waterways across the country, with Stockholm and Göteborg standing to each other very much as do Chicago and New York in this country. The rates by water are so low as to draw most of the tonnage except during the winter months when the canals are ice-locked.

About two-thirds of the 9650 miles of railroads in Sweden are privately owned. The privately owned railroads were in the main constructed in response to commercial needs. The government-owned roads were for the most part built for political and military considerations. At present there is not much difference in the financial returns from the two types of management. Under government management and regulation the rates remain about the same the year through. Consequently freight tends to move by water during the summer and by rail during the winter. The roads would attract more traffic

than they do each year, if they were permitted to carry freight in competition with the waterways during the summer at canal rates plus what shippers would be

RAILROADS OF SWEDEN

For the Year Ending December 31, 1925

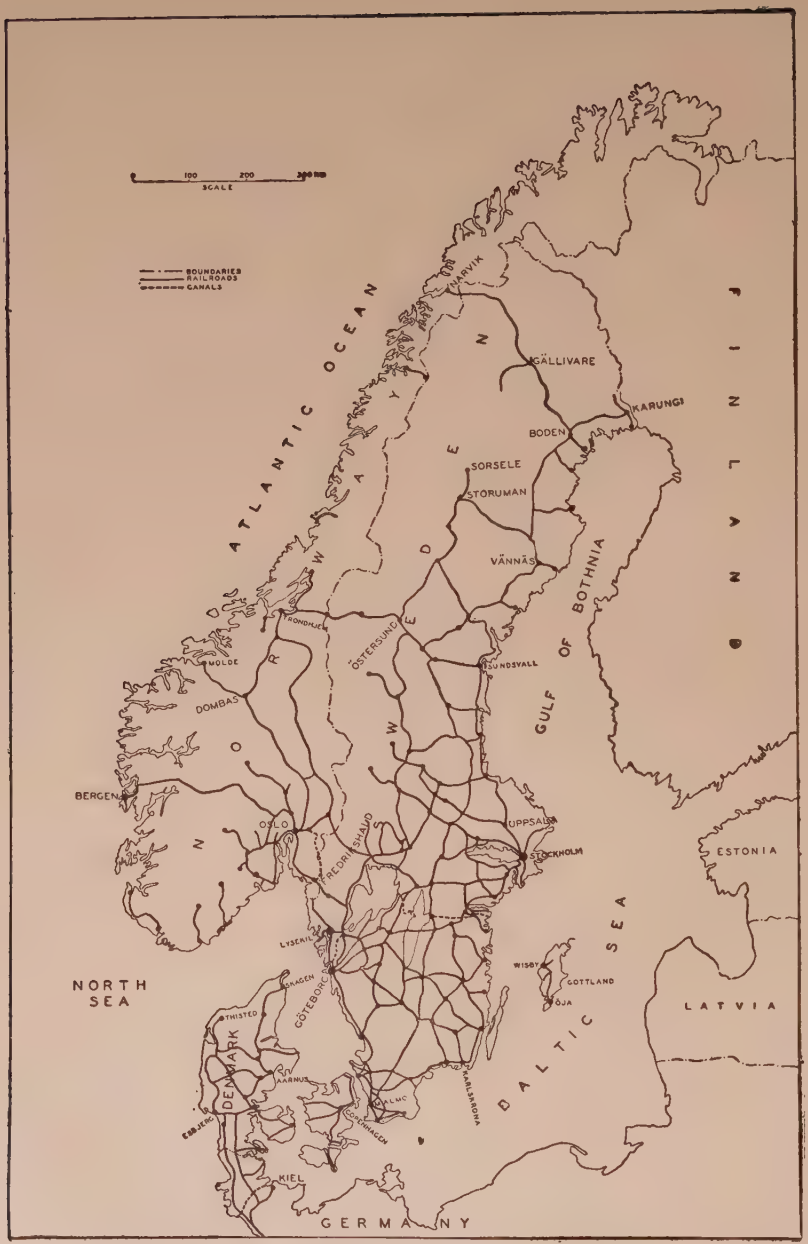
Item	Private Railroads	State System	All Railroads
Average miles operated	5,971	3,712	9,653
Capitalization or cost of construction	$195,890,955	$281,317,528	$477,208,482
Capitalization or cost of construction per mile	32,553	75,325	48,933
Employees and equipment:			
Number of employees	23,671	27,686	51,357
Number of locomotives	1,167	1,057	2,224
Number of passenger cars	2,234	1,987	4,221
Number of freight cars	31,955	26,668	58,623
Services:			
Passengers carried—all classes	38,078,400	27,659,989	65,738,389
Passengers carried—first class[a]	711,060	708,330	1,419,390
Tons of freight carried	23,999,383	18,001,924	42,001,307
Tons of freight carried one mile	814,561,603	1,546,214,707	2,360,776,310
Train miles	19,915,653	15,835,986	35,751,639
Locomotive miles	23,671,150	22,147,924	45,819,074
Results of operation:			
Operating revenues	$ 38,624,742	$ 50,220,786	$ 88,845,528
Operating expenses	32,826,640	41,747,341	74,573,981
Net operating revenue	5,798,102	8,473,445	14,271,547
Operating ratio—per cent	84.99	83.13	83.94
Charges:			
Passenger revenues	11,666,639	15,728,187	27,394,826
Average receipts per passenger—all classes	0.31	0.57	0.42
Average receipts per passenger—first class[a]	1.32	4.14	2.73
Average receipts per passenger mile—all classes	2.295¢	2.075¢	2.165¢
Average receipts per passenger mile—first class[a]	3.403¢	2.791¢	2.920¢
Freight revenue	24,289,160	30,419,977	54,709,137
Average receipts per ton mile	2.974¢	1.956¢	2.309¢

[a] Class I and II passengers.
Source: Sveriges Officiella Statistik, Allman Jarnvagstatistik ar 1925.

willing to pay for greater dispatch and certainty of delivery by a specific date.

Norway

In Norway there are 2240 miles of railroad. This is all owned by the Government except 275 miles. There is only one important private line in Norway. The other lines



Scandinavian Railroads

privately owned are small industrial tracks. One hundred and two miles of road in Norway are electrically operated, three-fourths of the electrically equipped mileage belonging to the State.

In connection with the operation of private railroads in Norway, it should be stated that the Norwegian Government has as a rule furnished half of the estimated installation capital. Half of this fifty per cent contribution on the part of the State toward the construction of private railroads is furnished against shares in the private railroad, and the rest as a mortgage on the railroad's income. When private railroads in Norway have shown themselves incapable of bearing their operating expenses, the Norwegian Government has furnished them with aid. The communities and other interested organizations have also supported railroads unable to bear their operating expenses.

The Norwegian State railways are under the administration of the Chief Management of Railways, which is under the Department of Public Works. The Chief Management of Railways, with its main office in Oslo, consists of a general manager, four assistant railway managers, and five members selected by the Norwegian Parliament for a period of three years. There is also one member of this management who represents the employees of the State railways and is chosen by the latter annually. To facilitate administration, the State railways are divided into nine districts, each one of which is under the management of a district chief.

During recent years, certain sections of the Norwegian State railways have suffered from competition with privately operated motor busses. This competition has resulted in a steady decline of passenger earnings. The competition from the motor busses is particularly acute in

suburban districts and in certain areas visited by tourists and sportsmen, areas from which there is practically no freight revenue. The railway officials have solicited authority from the Government to operate motor busses in connection with trains and train service. A committee was

RAILROADS OF NORWAY
For the Year Ending June 30, 1926

Item	Private Railroads	State System	All Railroads
Average miles operated	275	1,965	2,240
Capitalization or cost of construction	$12,574,703	$169,885,931	$182,460,634
Capitalization or cost of construction per mile	45,726	86,456	81,495
Employees and equipment:			
Number of employees	2,012	9,234	11,246
Number of locomotives	45	452	497
Number of passenger cars	67	1,569	1,636
Number of freight cars	678	10,414	11,092
Services:			
Passengers carried—all classes	3,975,574	18,837,158	22,812,732
Tons of freight carried	1,016,799	9,921,361	10,938,160
Tons of freight carried one mile	44,978,560	373,370,429	418,348,989
Train miles	977,023	7,317,728	8,294,751
Locomotive miles	1,300,516	8,920,545	10,221,061
Results of operation:			
Operating revenues	$ 4,378,113	$ 23,691,482	$ 28,069,595
Operating expenses	4,015,650	22,932,618	26,948,268
Net operating revenue	362,463	758,864	1,121,327
Operating ratio—per cent	91.72	96.80	96.01
Charges:			
Passenger revenues [a]	1,606,897	11,084,890	12,691,787
Average receipts per passenger—all classes	.....	0.50	.....
Average receipts per passenger mile—all classes	.....	3.062¢	3.019¢
Freight revenue [b]	2,610,978	11,793,567	14,404,545
Average receipts per ton mile	.....	2.778¢	3.052¢

[a] Passenger-train revenue. [b] Freight-train revenue.
Source: Norges Offisielle Statistikk, Norges Jernbaner Beretning for Aret 1 Juli 1925—30 Juni 1926.

organized in the Norwegian Parliament in 1926 to study and to report on the relation between railway operation and bus traffic.

Denmark

Railway business in Denmark does not seem to be paying its way. In Denmark the railway mileage is about

equally divided between state and private management. For the year ending March 31, 1927, the operating ratio of privately managed railroads was 101 per cent, and for government operated roads, it was 117 per cent. Denmark has 16,602 square miles of territory and a population of 3,420,000. It is served by 3230 miles of railroad.

RAILROADS OF DENMARK
For the Year Ending March 31, 1927

Item	Private Railroads	State System
Average miles operated	1,661	1,569
Capitalization or cost of construction	.....	$115,923,424
Capitalization or cost of construction per mile	.....	73,884
Employees and equipment:		
Number of employees	3,458	18,459
Number of locomotives	421	692
Number of passenger cars	457	1,915
Number of freight cars	2,881	11,893
Services:		
Passengers carried—all classes	13,250,104	29,562,158
Passengers carried—first class	.....	10,135
Tons of freight carried	3,582,208	6,795,554
Tons of freight carried one mile	46,713,477	386,343,901
Train miles	6,832,688	11,510,940
Locomotive miles	.....	17,853,077
Results of operation:		
Operating revenues	$7,465,331	$34,384,500
Operating expenses	7,557,116	40,384,977
Net operating revenue	Def. 91.785	Def. 6,000,477
Operating ratio—per cent	101.23	117.45
Charges:		
Passenger revenues	$2,906,673	$14,368,272
Average receipts per passenger—all classes	0.22	0.49
Average receipts per passenger—first class	.....	7.29
Average receipts per passenger mile—all classes	2.200¢	2.131¢
Freight revenue	3,671,829	17,575,570
Average receipts per ton mile	7.892¢	4.551¢

Def.—Denotes Deficit.
Source: De Danske Statsbaner, Beretning om Driften i Aaret fra 1 April 1926 til 31 Marts 1927.

From the scanty sources of reliable information available in this country concerning Scandinavian railroads, one is led to the conclusion that only a few relatively short lines of railroad were required by the development and possibilities within these countries. For the most part, private capital was forthcoming to supply such de-

mands for railway transportation. Other lines were projected largely out of military and political considerations. It was difficult to obtain capital for such projects. In order to carry them through, the respective governments had to finance both the construction and the equipment of railroads which could not promise enough business, at least for quite a time, to pay their way.

HOLLAND

Holland is well supplied with rivers and canals. Along these waterways is transported the bulk freight, both that originating in Holland and that moving to or from Germany. Although the Netherlands possessed an excellent system of water transportation, it was apparent, early in the history of railway development, that a high class of freight and passenger service would justify building railroads in Holland. The State encouraged railway construction, even building some of the important lines. From the outset there was not much doubt about the financial security of railroads in Holland.

Though about one-half of the 2262 miles of railroads in Holland is owned by the Government, the operation of all railroads in that country has always been in private hands. In 1890 the Government bought up all the lines it did not own at that time and apportioned them between two companies, each of which was given access to every important town in competition with the other. In 1908 a movement to have the Government operate the railroads was defeated, and later a parliamentary commission made a report unfavorable to complete nationalization. Again in 1918 an attempt at further nationalization failed.[1] The state-owned mileage is leased to the private companies by which the state-owned lines are

[1] League of Nations, p. 245 *ff.*

operated along with the company-owned mileage as part of the company system. Private management of the Dutch railroads is subjected to government regulation. For example, the consent of the Minister of Public Works is required before a company may alter, improve, or extend existing railroads or build new lines. In the event

RAILROADS OF HOLLAND

For the Year Ending December 31, 1926

Item	Private Railroads
Average miles operated	2,262
Employees and equipment:	
Number of employees	39,100
Number of locomotives	1,377
Number of passenger cars	5,024
Number of freight cars	33,116
Services:	
Passengers carried—all classes	48,132,236
Passengers carried—first class	957,470
Tons of freight carried	22,032,122
Train miles	29,280,375
Locomotive miles	39,854,669
Results of operation:	
Operating revenues	$65,682,378
Operating expenses	48,059,904
Net operating revenue	17,622,474
Operating ratio—per cent	73.17
Charges:	
Passenger revenues	30,748,578
Average receipts per passenger—all classes	0.64
Average receipts per passenger—first class	2.38
Freight revenue	30,083,670

Source: Bulletin des Transports Internationaux, November, 1927.

that the company and the minister cannot agree the question shall be referred to arbitrators.

Of the annual profits the companies retain an amount equal to four per cent of their capital. Of the profits realized above these amounts, the State receives one-half until the entire share of the company amounts to six and one-half per cent of its capital; of the remainder, four-fifths goes to the State and one-fifth to the company. In

Railroads of Belgium and Holland

1916 Holland abandoned the policy of fostering competition between railroads and permitted an amalgamation of the two strong companies and of a few private companies that were leading an independent existence. Under

this consolidation all of the railroads of Holland are in the hands of two companies, combined under the name of "Nederlandsche Spoozwegen." Under the arrangement, the two companies continue to lead a separate life as to their agreements with third parties, while by the Government they are treated as though they were one. The boards of directors and the management are united in the same persons. There is a community of assets and liabilities, not of capital; the profits are equally divided in proportion to the capital of the respective companies.

BELGIUM

Construction of railroads was begun in Belgium soon after the secession of that country from Holland. By 1840 the Government had built two hundred miles of main trunk lines from the Rhine and German frontier through Liége and Brussels to the Schelde and North Sea, thereby enabling Antwerp to compete with Rotterdam. Some private construction was also going forward, but by 1850 two-thirds of the railroads were state owned and the privately owned roads were tributary to those built by the State. In that year the State for financial reasons stopped building railroads and private companies began building faster than ever before. By 1860 two-thirds of the railroads were privately owned and the private roads were consolidated into strong systems.

After private lines began to be built in Belgium, their owners did not regard their property as being only local and acting merely as feeders to the state-owned lines. The private roads entered into agreements and worked out affiliations among themselves with a view to entering into competition with the state roads for through traffic. It happened that this competition in Belgium between state-owned and privately owned railroads was

rather even. While the State had somewhat better routes, the advantages possessed by private companies in soliciting business just about offset this difference. The struggle established in Belgium very low passenger and freight rates and also brought about a great increase in efficiency of operation. Unfortunately the competition became cutthroat in its methods. The State instead of dominating the situation rather abandoned schedule rates, and had recourse to personal discrimination and to special contracts of every kind. The government railroads even made special rates to prevent people from using the Government's own canals. It would seem that in this type of competition the State is not necessarily stronger than private companies but may be weaker. Public opinion will not allow the State to exercise its power to forbid private companies engaging in competition. If private railroads are run for a profit and succeed in making money, the state railroads must likewise make money or else the government authorities must face the criticism of an indignant public. On the other hand, it is very difficult for a government to show earnings from a business venture.

As a result of failure in competition with the privately owned lines, the Belgium Government acquired those lines and from that time until July, 1926, controlled and operated the principal railroads of the country. The State eventually obtained a half interest even in the light railroads.

Why should railroads in Belgium have been operated so long by the Government when across the border in Holland, where conditions are similar, the roads are operated by private companies?

Belgium, like Holland, is favorably situated for the development of railway traffic of high grade. Like Hol-

land, Belgium is densely populated. The area of Holland is 12,582 square miles as against 11,373 square miles for Belgium. Whereas the population of Holland in 1913 was 6,213,000, the population of Belgium in that year was 7,571,000. In Holland in 1913, 2333 miles of railway line were operated and in Belgium 2715 miles. Holland required 37,658 employees in that year and Belgian roads employed 73,425. The Holland roads showed 1,454,000,000 passenger miles as against 3,879,000,000 passenger miles in Belgium. Holland received about $15,000,000 total passenger revenue as against the Belgium lines' $74,000,000. Freight revenue in Holland was approximately $15,000,000 as against $44,000,000 for Belgium. The operating revenue per mile of line in Holland was $14,000 and in Belgium $23,665. The operating expenses per mile of line in Holland were $9850 and in Belgium $16,400. The net operating revenue per mile of line in Holland was $4205 and in Belgium $7260. The operating ratio in Holland was 70 per cent in 1913, and 69 1/3 per cent in Belgium in 1912.

While Belgium is small and compact, it is also very rich. The population is crowded, active, and intelligent. The industries are varied. Moreover, Belgium is on the highway between England and Germany, so that in addition to heavy local traffic the Belgian lines secure considerable through traffic on commodities moving between England and Germany.

From this comparison between conditions in Belgium and Holland, it is apparent that economic reasons do not exist for a procedure in railway management in one country different from that in the other.

The answer is found in political considerations. The demand for the first railway construction came just as Belgium was setting up a state independent of Holland.

King Leopold and his ministers were quick to see that considerable private capital seeking investment in Belgian railroads would come from Holland. They feared the political consequences of having their railroads controlled by capitalists in Holland. They believed that if Belgium was to remain politically independent of Holland, economic independence would be desirable. In order to insure freedom from the control of Dutch capitalists, the Belgian Government began to build the needed railroads.

Although fear of the influence of Dutch-owned railroads had prompted Belgium to enter upon a period of government construction and ownership, there was later a marked tendency toward private ownership, particularly after 1850. Fortuitous circumstances checked this tendency and ultimately brought practically all railway lines under government ownership and management.

After the State purchased the rival lines and acquired a virtual monopoly, there seems to have been a diminution of activity and a tendency toward slackness of management. There was a considerable lowering of profits without corresponding changes in rates. Low rates on goods were maintained and passenger rates, especially tickets for laborers, were lowered to a point which experts claim resulted in loss. Train service, it is contended, became inferior to that in neighboring countries. Germany at one time threatened to divert the mail by way of Holland unless the service should be improved. Road maintenance was curtailed until trains were forced to move under slow orders.

There has been much complaint of political entanglements between the Government and the management of the railroads. It is said that the connection between the Belgian railroads and politics has produced bad results.

The opponents of the party in power claimed that their long tenure had been largely due to the patronage and influence which the railroads gave them. It is pointed out that the Belgian lines employed about fifty per cent more men per mile of line than did the French railroads which cross the Belgian border. The railway staff cast about six per cent of the total votes polled. It is claimed that by very low fares the Ministry kept the workingmen in the country away from possible adverse political influence. Then, too, it is pointed out that the railway budget in Belgium has been inextricably bound up with the state budget.

In the selection of appointees to vacant places in the railway service the Government has opposed the competition of a well-ordered civil service and has rather favored appointments from lists recommended by senators, deputies, and priests. Promotion has been by seniority or special merit, and this merit seems to have been political. As an example of political entanglement in railway management, one may cite a telephone conversation by the Minister just before the elections of June, 1912, ordering an increase in wages to be retroactive to January.

The State had only a 50 per cent interest in light railways and whenever the light railways desired to reduce rates which might result in competition affecting the state railway revenues the Minister refused to authorize the reduction.[1]

Just before the War a Commission was appointed to study the transportation question in Belgium. The Commission had determined to recommend that the construction of new lines should in the future be entrusted to a

[1] W. M. Acworth, "Historical Sketch of Government Ownership of Railroads in Foreign Countries," p. 57.

contractor and not be left in the hands of the railway administration and they were seriously considering the grant of a lease for the state railways to an operating company.[2]

Following the War the Belgians decided that there should be a change in the method of operating the railroads of the country. By a law of July 23, 1926, the Belgian State railroads were transferred to a private company, known as the "Société Nationale des Chemins de Fer Belges," which was approved by Royal Decree of August 7, 1926. The duration of the company is to be seventy-five years from August 1, 1926. The capital of the new company was fixed at eleven billion francs, represented by twenty million preferred shares of five hundred francs each. The Government turned over to the new company all of the railway property formerly owned by the State, together with the right to use the properties. In compensation for the surrender of the railroads to the private company, the Government took the shares of stock which it proceeded to dispose of largely to the Belgian public in exchange for short-term treasury notes. Less than a million shares were sold in Switzerland and Holland. In the summer of 1927, 9,012,000 shares were held privately in Belgium, and were quoted on the Brussels exchange at 580 francs. After the transfer of the railroads to the private corporation, only about three hundred kilometers of normal gauge line remained in the hands of other companies. Thus this new company has practically a complete monopoly of the Belgian rail-transport system.

As yet it is too early to make comparisons between the financial results of the operation of Belgian railroads by a private company and by the State. However, prelimi-

[2] Acworth, *loc. cit.*, p. 61.

nary figures indicate that profits for the first ten months after September 1, 1926, amounted to four hundred and twenty-two million francs as against only one hundred

RAILROADS OF BELGIUM

For the Year Ending December 31, 1925

Item	State System
Average miles operated	2,954
Capitalization or cost of construction [a]	$805,640,182 136,286,768
Capitalization or cost of construction per mile [a]	272,729 46,136
Employees and equipment:	
Number of employees	104,388
Number of locomotives	4,629
Number of passenger cars	9,352
Number of freight cars	144,087
Services:	
Passengers carried—all classes	222,746,979
Passengers carried—first class	1,561,230
Tons of freight carried	77,916,027
Tons of freight carried one mile	4,820,185,909
Train miles	43,952,023
Locomotive miles	66,124,596
Results of operation:	
Operating revenues [a]	$334,845,428 56,644,396
Operating expenses [a]	309,314,901 52,325,504
Net operating revenue [a]	25,530,527 4,318,892
Operating ratio—per cent	92.37
Charges:	
Passenger revenues [a]	$87,605,121 14,819,791
Average receipts per passenger—all classes [a]	0.39 0.07
Average receipts per passenger—first class [a]	2.82 0.48
Average receipts per passenger mile—all classes [a]	2.330¢ 0.394¢
Freight revenue [a]	$237,005,728 40,093,264
Average receipts per ton mile [a]	3.866¢ 0.654¢

[a] The upper and larger figure is at the normal rate of 19.3¢ per franc, while the lower and smaller figure is at the rate of 3.2649¢ per franc, which was the average rate of exchange prevailing during the year 1925.

Source: Royaume de Belgique, Chemins de Fer, Compte rendue des operations pendant l'annee 1925.

and seven million francs for a corresponding period of the previous year. This estimate of profits is in addition to the twenty-five million francs which, beginning January 1, 1927, must be set aside by the company for purchase of new equipment.

SWITZERLAND

Switzerland, like Belgium and Holland, is a relatively small country. While there is not much in Swiss experience that would be applicable in a country so large as the United States, yet that experience is quite interesting. Dunn points out [1] that Switzerland affords one of the most notable examples of the last thirty or forty years of a country committing itself to public ownership and operation. Although the railroads were originally built by private companies, the possibility of state ownership was contemplated from the beginning. In 1851 a law was passed providing that those who erected public works under franchises granted by the Swiss Government should be bound at any time to turn them over to the Government for full compensation. Though an extensive network of railroads was spread throughout Switzerland through the initiative of private companies, there continued to be discussion of state ownership.

The Federation found itself unable to control the railroads effectively because of its limited legal powers, and the individual cantons were not able to exercise such control because they were small and weak. Nevertheless, in 1893, the Government decided against acquiring several railroads, the charters of which expired that year. In the meantime, Belgium, Prussia, Austria, and Hungary had adopted policies of government ownership. These examples perhaps had considerable influence with the thoughtful Swiss leaders. Furthermore there was great fear of the influence of foreign countries on Swiss railway affairs because foreign capital had been largely employed in the construction of the Swiss roads.[2] Apparently foreign stockholders were in control in three of the leading com-

[1] "Government Ownership of Railways," p. 35.
[2] Hans Dietler, "Nationalization of Swiss Railways."

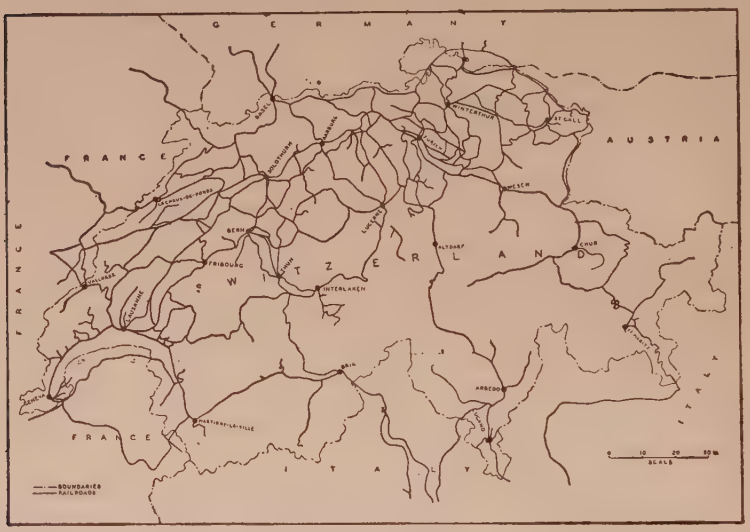
panies and this appeared to the Federal Council to be politically dangerous.

The Federal Council conducted a campaign in 1898 in behalf of government ownership, promising that if state ownership prevailed the highest wages then paid on any railroad in the country would be made standard on all, and the lowest rates obtaining on any line would be made standard on all.[3] Acworth was of the opinion that the fact that the bulk of the Swiss railway capital was held in France and Germany was one of the main reasons if not the main reason which in the end induced the Swiss people to nationalize their railroads.[4] In 1901 three lines were acquired by the Government, in 1903 a fourth, and in 1909 the last large company was transferred to the State. The act under which Switzerland acquired railroads provided that the railway budget was to be independent of the ordinary budget of the State and any surplus obtained was to be devoted solely to railway purposes either as capital or for a reduction in rates and improvements in service. The purchase price of the railroads was fixed by agreement, but it exceeded the estimate by eleven per cent.

During the early years, expenses rather rapidly increased due to more generous service, higher wages, and reduced earnings. The operating ratio rose from 65.5 per cent in 1903 to 71 per cent in 1908. From 1903 to 1907 the cost of the staff increased ten per cent year by year as compared with 1902; from 1900 to 1911 wages increased ninety-two per cent. In 1912 there was a further increase in wages of ten per cent. From 1900 to 1911 the number of the staff increased forty-six per cent. From 1900 to 1911 the average fare was reduced thirteen and

[3] Dunn, *loc. cit.*, p. 36.
[4] W. M. Acworth, "Relation of Railways to the State," p. 2.

one-half per cent. In 1900 the ton-mile rate was slightly under three cents, whereas in 1911 the ton-mile rate was slightly more than three cents. It was estimated that the profit would extinguish the railway debt in sixty years. The sum paid for the railroads was $205,494,000. At the end of the first fifteen years of this sixty-year period, instead of the debt having been decreased by one-fourth or some appreciable fraction, it had risen to $270,000,000.



Railroads of Switzerland

Immediately following the War the Federal Railways of Switzerland were reported to be showing a big deficit in spite of increased fares and great curtailment of train service.[5] The deficit had increased from $14,000,000 in 1917 to $41,500,000 in 1918 due largely to increase in wages, pensions, and costs of supplies.[6] In 1921 it was reported, because of the high rate of exchange for Swiss

[5] *Railway Age*, February 14, 1919, p. 418.
[6] *Ibid.*, April 18, 1919, p. 1012.

money, neighboring countries were routing traffic around Switzerland and that for the same reason tourist travel had been greatly reduced.[7] At this time there was considerable agitation in Switzerland for a denationalization of railroads. By 1926 conditions in Switzerland were greatly improved. It was reported that earnings have been good for three years, that electrification was going forward, and that both the passenger and freight business handled in 1925 somewhat exceeded the totals for 1913.[8]

Some very interesting competition for traffic has recently appeared in Switzerland. First was the competition of the motor bus. In 1925 and 1926 trucks and tractors were very active in hauling freight.[9] Their number rose from 151 in 1913, and 3331 in 1920, to 8253 in 1925, and to 10,300 in 1926. This competition caused much anxiety to the directors of the Swiss Federal Railways. In order to meet the situation they lowered freight rates somewhat and organized a motor-car service furnished by a company controlled by the Swiss Railways through ownership of a majority of the shares of stock. This subsidiary corporation operated a line of trucks in coöperation with the railroads. These measures had the effect of recovering tonnage. In 1926 the total tonnage transported by the Swiss Railways was 16,804,000, which was 205,000 tons more than in the next record year, 1924. The average receipts per ton, however, fell from 13.53 francs in 1925 to 12.72 francs in 1926.

Competition has also shown itself in the struggle for the privilege of carrying the transit-freight traffic. The German and French lines have granted extremely low

[7] *Ibid.*, January 7, 1922, p. 88.
[8] *Ibid.*, January 2, 1926, p. 143.
[9] Statement by the Swiss Bank Corporation of Basel.

rates for this traffic. The Swiss lines, being anxious to haul as much of the transit traffic as possible, have granted almost equally low rates. That action of the Swiss Railways has caused much dissatisfaction among

RAILROADS OF SWITZERLAND
For the Year Ending December 31, 1925

Item	Private Railroads	State System	All Railroads
Average miles operated	1,545	1,828	3,373
Capitalization or cost of construction	$149,120,560	$449,905,870	$599,026,430
Capitalization or cost of construction per mile	96,518	246,119	183,432
Employees and equipment:			
Number of employees	7,132	35,457	42,589
Number of locomotives	349	1,053	1,402
Number of passenger cars	1,315	3,507	4,822
Number of freight cars	3,109	18,394	21,503
Services:			
Passengers carried—all classes	45,940,383	101,827,814	147,768,197
Passengers carried—first class	100,180	409,332	509,512
Tons of freight carried	6,643,974	18,118,262	24,762,236
Tons of freight carried one mile	98,461,909	1,205,968,595	1,304,430,504
Train miles	9,772,297	19,959,358	29,731,655
Locomotive miles	10,392,769	25,252,920	35,645,689
Results of operation:			
Operating revenues	$ 15,209,297	$ 74,486,856	$ 89,696,153
Operating expenses	10,930,421	53,281,772	64,212,193
Net operating revenue	4,278,876	21,205,084	25,483,960
Operating ratio—per cent	71.87	71.53	71.60
Charges:			
Passenger revenues	8,319,621	26,935,899	35,255,520
Average receipts per passenger—all classes	0.18	0.26	0.24
Average receipts per passenger—first class	2.18	3.49	3.23
Average receipts per passenger mile—all classes	2.999¢	1.820¢	2.020¢
Average receipts per passenger mile—first class	9.282¢	4.694¢	5.022¢
Freight revenue	6,342,716	42,911,693	49,254,409
Average receipts per ton mile	6.442¢	3.550¢	3.776¢

Source: Statistique des Chemins de Fer Suisses 1925.

Swiss manufacturers and considerable criticism by Swiss newspapers because those rates do not apply to inland shipments in Switzerland. Yet it is difficult to see how the Swiss lines could participate in this overhead traffic unless they met the rates published by German and French roads. In 1925 the French lines reduced rates

and secured the greater portion of the transit traffic to and from Italy and southern European countries. Even shipments from Germany were being routed over the French line, and the low rates were responsible for the fact that in 1925 the French line handled 2,680,000 tons of freight at Basel whereas the German line at that place handled only 143,000 tons. To meet this competition the officials of the German line provided for a system of rebates to the transit shipments by German firms, which more than offset the difference between their rate and the transit rate of the French road. The German road through this expedient increased its transit tonnage at Basel from 143,000 tons in 1925 to 407,000 tons in 1926. It is claimed that the transit traffic is being handled by the Swiss Federal Railways at a loss and that to make up the difference it is necessary to maintain high rates on shipments within Switzerland. Swiss manufacturers are complaining that transit traffic is receiving preferential treatment and that local rates are five or six times higher than those charged foreign merchants for freight passing through Switzerland. This is a most striking instance of international competition in railway transportation. Some sort of international tribunal may have to be appealed to in order to protect international railroads from cutthroat competition among themselves.

LUXEMBURG

In Luxemburg there are 542 kilometers of railroad. The Guilloume-Luxemburg Railway Company owns 207 kilometers, which has been equipped and is operated by the Alsace-Lorraine Railways. The Alsace-Lorraine Railway Company pays the Government of Luxemburg one million paper francs per annum for the use of the line. The Prince Henri Railway operates 193 kilometers of

the railway mileage in Luxemburg. That company owns its own equipment. Three companies together own and operate 142 kilometers of narrow-gauge lines, which transport about 110,000 tons of freight a year.

CHAPTER III

FRANCE AND SPAIN

FRANCE

After this brief survey of the ownership and management of some relatively small railway systems in small countries, attention may be turned to the railway service with which the French have provided themselves. France is about four-fifths the size of the State of Texas and has a population of about 40,000,000. The country is served by 26,500 miles of railroad. If the second tracks are counted there are about 12,000 miles additional.

France had developed a vigorous nationalism before the eighteenth century. Under a strong monarchy a system of roads and canals was built which gave France the best system of transportation to be found in Europe during the eighteenth century. Highways, canals, and rivers bound the provinces together, made Paris accessible to all parts of the country, and gave Napoleon great advantage in mobilizing troops who carried triumphant banners into almost every European capital. For a generation after the fall of Napoleon, France drifted, groped her way, suffered from lack of able and sustained leadership in the Government. French nationalism had developed under a vigorous central authority. Frenchmen came to look to the Government for guidance and leadership in pursuit of business opportunities. During the years following Waterloo, their Government too frequently lacked intelligence, courage, and patriotism. In

the meantime the English with initiative, self-reliance, and unrestrained under their policy of *laissez-faire,* were applying the new inventions to production and sending their ships throughout the world in search of markets. The industrial revolution spread from England to America. From 1825 to 1830 the steam locomotive was shown to be adapted to the railroad. The English and Americans at once became active in constructing the new type of transportation. The French had their canals and highways. They had long boasted and enjoyed their superiority in transportation facilities. They looked to the Government for leadership. The Government was not impressed by the new device—manufacturing was but slowly passing from the handicraftsman to the factory. The tradesmen saw no necessity for railroads. In 1832 a wealthy Parisian sought a concession to build a railroad from Paris to Marseilles. There was such an outcry from hostlers, horse breeders, stagecoach owners, canal bargemen, peasants, and even merchants all along the route that the proposal was dropped. A few visionaries dreamed of a national system of iron roads.

In 1833, Parliament, which had asserted its right to exercise functions which previously had been the prerogatives of the king, voted a half-million francs to be used by the Minister of Public Works in a study of the technical and commercial aspects of the railroad. For ten years this was supplemented by an annual grant of fifty thousand francs. Accordingly Michael Chevalier was sent to England and to the United States to study railroads. In 1837 a report was made to Parliament of a plan for a national system of railroads.

The Ministry of Public Works had been created by Sully and Henry IV in the sixteenth century. One of its bureaus for many years had been supervising the con-

struction and repairs of national roads, had been building canals and setting up technical standards for canal construction, and long had supervised the technical aspects of the construction of railroads which were being built in the coal fields. The Ministry in 1838 submitted a more definite report, recommending that there should be six lines radiating from Paris to the main frontiers, and two or three cutting across the South from east to west. The proposals followed the established routes of travel and conformed to the national ambition to look to Paris as the commercial as well as the political capital. It was assumed that the State would build the lines, the total proposed being 2750 miles. But the State was in no position to assume a burden of one billion francs. Concessions were granted to private companies. These had such difficulty in obtaining funds that they came again and again to Parliament for subsidies and guarantees. Finally with the assistance of English engineering experience and English capital, the French began railway construction.

Under the laws of 1842, 1845, and 1846 the Government agreed to furnish the right of way and to build the roadbed and structure, and private companies were to supply the rolling stock and operate the lines. The Ministry of Public Works was confirmed in authority to supervise construction and the technical phases of operation. Rates were to be approved by the Ministry. Moreover, the Minister had power to prevent discriminations and to enforce measures for public safety. The concessions usually ran for forty years and provided that at their expiration the roads were to become government property. This is a provision which has characterized concessions by the French Government through all the vicissitudes of their railway history. Under the plan that

had been worked out by French economists and statesmen, railway transportation was considered to be naturally monopolistic. Each line was therefore laid out to serve a distinct territory. Originally there were to have been nine systems. After the revolution of 1848 had checked early railway development, new legislation was passed in 1852 extending the charters of the companies for ninety-nine years from that date. There was considerable activity during the next five years, when again building was arrested by the crisis of 1857. In the meantime the systems had been reduced from nine to six, five of these radiating from Paris.

The railway systems of France being based upon Paris have enabled that city to retain its position as the commercial capital of the country, but there has been too little physical connection between the systems, and the general development of France has perhaps been retarded through this arrangement of the railway system so favorable to the capital city.

Under Napoleon III there was great activity in building railroads in France. Between 1857 and 1870 there was demand for branch lines to meet the industrial needs of the country. Each company had a monopoly within its own territory and lacked incentive for constructing the branch lines which would serve as feeders for the business tributary to each road and which would come to it whether branch lines were built or not. The Government by its usual guarantees of interest encouraged the building of the desired extensions.

The Franco-Prussian War of 1870-71 again stopped railway construction in France. The government guarantees of interest apparently had paralyzed the initiative of railway management. The new lines that had been constructed by small companies soon became financially

involved. The French people were very much impressed after this war by anything the Germans were doing. They had been stunned by their defeat at the hands of Germany, and were inclined to attribute their misfortunes to superior organization within the German states. They saw Germany at this time definitely committed to a policy of state ownership of railroads. France followed along the same lines and began to buy up the small companies in the West and Southwest. Under the leadership of Gambetta the country was definitely committed to a policy of nationalization of railroads. In 1883 Gambetta died, and by that time it was becoming apparent to the French leaders that the people could not stand the strain of their burden of taxation and of schemes for acquiring and extending railroads. The increasing financial troubles of the Government after 1881 placed it at a great disadvantage in the management of state-owned roads in competition with the private companies.

The latter took advantage of the situation to obtain from the Government in 1883 a surrender of the right to purchase the private roads except upon terms practically prohibitory, the cessation of the Government's efforts at competition with them by new construction of its own, and a grant to the private companies of the recently constructed state lines. New conventions were made with the six big companies providing for incorporation into the systems of these companies of all the state lines except a small unified system restricted to the Southwest and consisting of about 1900 miles. The Government guaranteed to the companies the dividends they had been accustomed to paying on all of their stock and the interest on the bonds already issued and on those to be issued for new construction. At the expiration of the agreements between 1950 and 1958 the railroads in the

absence of some change will pass into the possession of the State. Under a law passed in 1888 it was provided that in time of war the control of the railroads is entirely in the hands of the military authorities.

Under the provisions just set forth France abandoned extensive government ownership and went along for twenty years without any particular agitation in behalf of nationalizing the roads. In the meantime there were extensions and improvements and the credit of the roads was permanently established. It came to be the practice for the French roads to sell their bonds in small denominations direct to purchasers. That is to say, any peasant or laboring man desiring a railway bond could call at one of the offices of the railroad and upon being directed to the proper window, he could obtain and carry away with him the railway bond he might desire. The interest rate on the French railroad securities fell to four per cent and even as low as three per cent.

By 1906 there was a revival of agitation in France for government ownership of railroads. The Government owned a system of about 1850 miles which ran from Nantes and Bordeaux by inferior routes and entered Paris over private tracks. The western lines were financially weak. Traffic on them was very light because they served an agricultural country and the River Seine took the profitable traffic between Paris and Havre. Equipment on these lines was poor and government approval to raise necessary capital for improvements could not be obtained. The employees of the Western Railway were in favor of government ownership and the socialists were clamorous for it, but the representatives in Parliament from the districts served by the Western were very much opposed to government ownership. The matter was discussed for some two or three years and finally the Senate

passed a bill for the purchase of the Western Railway by the State with a majority of some three votes. The bill certainly would have failed but for the fact that the Prime Minister, M. Clémenceau, insisted that he would resign if it was not passed; and though a number of the senators disliked government purchase of the Western Railway they did not want to see Clémenceau resign. This acquisition increased the mileage owned and operated by the Government to something more than 5000 miles.

The business men of France had almost unanimously opposed this acquisition. The results of government ownership soon confirmed their worst fears. Under company ownership the operating ratio of the Western had varied from 56 per cent to 68 per cent. During the first five years of government ownership the operating ratio was as follows: 1909, 73 per cent; 1910, 80 per cent; 1911, 87 per cent; 1912, 89 per cent; 1913, 85 per cent. At the same time the operating ratio of the five large private companies rose from an average of 50 per cent for 1905 and 1906 to only 58 per cent for 1912 and 1913. During the last ten years of company management it was necessary for the State to pay an average of $2,900,000 annually to make up the deficit in the net operating income of the Western Railway. During the first three years of state management the deficits were $6,750,000, $8,875,000, and $14,935,000. The average compensation expenses for loss and damage under company control was $400,000 or $500,000 per annum. In 1911 under state control the figure was more than $2,000,000. The employees in the Central Office were increased in three years from 1526 to 2587. Between 1908 and 1913 receipts of the Western Railway rose $6,500,000 and expenditures increased $11,200,000. Most of the increase in expendi-

tures was for wages and salaries. Although wages were increased more rapidly on state lines than on private lines the efficiency of labor did not seem to increase in proportion to the increase in advantages in its favor. State ownership seemed to be conducive to illness. There was a most startling increase in sickness among railway employees after they had obtained from the Government a concession that wages would be paid in case of absence from work on account of sickness. In the transportation and maintenance departments the percentage on sick leave climbed to 45 per cent in 1909, and reached 55 per cent in 1911.[1] The average receipts on the state lines per employee in 1912 was 4000 francs and on other lines from 5000 to 6200 francs.

The reasons for this rather deplorable situation on the state-owned systems of France have been analyzed by the English authority, W. M. Acworth, as being due to three causes: 1st, abuse of formalism and red tape; 2d, lack of stability—directors and chiefs on the state-owned roads were changed at will of ministers; 3d, lack of discipline—from the electoral point of view, the lower staff being much more numerous had much more power than the superior staff. A further example of some of the difficulties encountered under state ownership is shown by the fact that when the Western Railway of France wished to establish a new service between London and Paris, the minister objected because he did not wish to charge the State with a cost of building up this new route, when the Western was not earning the full amount of its guarantee. On the other hand, the Northern was very prosperous and wished to reduce its rates between France and England to the level of those charged over the Western route. It was not allowed to do so be-

[1] S. O. Dunn, "Government Ownership of Railroads," p. 132.

cause that might have depleted the revenues of the Western and have increased the Government's guarantee. The result was that the shareholders of the Northern kept the extra profits made through refusal of the request to reduce rates. While France as a government has owned and operated only about one-fifth of its railway mileage since 1908, yet there is a tendency to rather extreme regulation of the private companies on the part of the Government. The result of all this is that the French roads are managed with great technical ability, but emphasis is put on economical working rather than on the quality of service so that passenger service has been infrequent and freight service much delayed as compared with that in England and the United States.

At the outbreak of the World War the military authorities under the law of 1888 took charge of the railroads of France. They were assisted in operation by the staffs of the companies who were mustered into the army and assigned to the operation of the trains. The following table shows the effect of the War upon the receipts of French railroads:

RETURNS IN MILLION OF FRANCS OF FRENCH RAILWAY COMPANIES, 1913–1917

Railroads	*1913*	*1914*	*1915*	*1916*	*1917*	*Miles in 1921*
Nord	336	208	111	125	137	2358
Est	305	196	114	133	134	3071
Paris-Lyons-Mediterranean	596	455	462	523	531	6078
Paris-Orléans	308	244	256	283	301	4844
Midi	147	117	122	125	138	2546
Etat	324	262	278	296	296	5599

Expenses of operating the roads rapidly increased due to the rise in prices of fuel and materials; to increases in wages; to provision for pensions, and to the great wear and tear on roadbed and equipment. Deficits had in-

creased by 1918 to an extent that Parliament voted a twenty-five per cent increase in rates except upon army shipments and parcel post.

In spite of this distressing financial situation, 1353 miles of the 1467 destroyed in northern France were reconstructed by 1920. After the War there was considerable agitation in France for government ownership of all of the railroads. The case of the state railroads already owned and operated by the Government was evidently taken as an example of what might be expected from government ownership in France. In 1918 the operating ratio of the state roads was 120 per cent; of the Midi, 87 per cent; of the Paris-Orléans, 85 per cent; of the Paris-Lyons-Mediterranean, 90 per cent. In 1921 the state railroads had a deficit of $87,500,000, or over half as much as the combined deficit of the five privately owned railroads. The employees of the state roads are not as well taken care of and have not the same opportunity for rapid advancement when they show ability as when the railroads are privately owned.[2] A large number of these employees have left the state railroads to take up other government positions. It is said that men very rarely leave the privately owned French railroads. In spite of the clamor of the socialists and the demand of railway employees, this experience with government-owned roads seems to have persuaded a great majority of French people for the present to reject further nationalization.

The French railroads since the War have made considerable improvements in their physical equipment, and have made substantial progress financially, though there was an appreciable deficit in 1927. Among the improvements are the extensive installation of the block system;

[2] *Railway Age*, September 12, 1919, p. 506.

the more extensive use of repeating signals in locomotive cabs; the further extension of the American telephone dispatching system on a number of lines; the application of steel underframes to old cars which had wood or com-

Railroads of France

posite underframes; the rather extensive substitution of electric lighting for gas; radio telegraphic communications on some trains in motion; an increase of refrigerator cars from a few of relatively poor type to 3000, many of which are most improved; the application of the Westinghouse air-brake system to freight trains at an

estimated cost of first installation of 1,600,000,000 francs; the electrification of 621 miles of line and plans for electrifying 870 miles more in the near future.

A statement of train accidents on French railroads is gratifying in that it shows a good and an improving record.

TRAIN ACCIDENTS ON FRENCH RAILROADS[3]

	Number of Accidents	Killed	Injured
1910	202	98	828
1911	207	60	592
1912	209	60	754
1913	142	60	413
1919	107	271	1064
1920	142	122	1184
1921	72	137	656
1922	49	96	544
1923	39	27	216
1924	47	39	296
1925	82	59	772
1926	92	53	501

In 1926 operations showed a surplus of 534,000,000 francs. In 1927 there was an estimated deficit of 421,000,000 francs. This was attributed to a general depression in business, the competition of highway vehicles, the competition of the waterways and the heavy transportation taxes. The law of August 3, 1926, fixed transportation taxes as follows:

	Per cent
For passengers and baggage	32½
For special accommodations	65
On freight	11½

The taxes in Czechoslovakia are 20 per cent on passengers, and 15 per cent on freight; in Germany, from 10 to 15 per cent on passengers and 7 per cent on freight; in England, 5 per cent on passengers and nothing on freight. There is no railway transportation tax on either

[3] M. Peschaud, *Railway Age*, January 7, 1928, p. 113.

passengers or freight in Denmark, Norway, Holland, Belgium, Switzerland, or Poland.

After the War the organization of the administration for the control of railroads was in five divisions: (1) a division of control on new line; (2) a division of control over track and structure; (3) a division of control of equipment and supplies; (4) a division of control of technical and commercial operation; (5) and a division of control of labor. The organization of financial control is a special service applying to all companies. These divisions were placed under a bureau chief with the title, Director of Control of Railways, subordinate only to the Minister of Public Works. The Director of Control of Railways was empowered to study all commercial questions concerning the transportation system as a whole, and was ordered to study the operation of maritime and river terminals and docks in relation to railroads.

The law of October 29, 1921, confirmed an agreement between the Minister of Public Works and the representatives of the various companies. This law contained these important provisions: (1) it created a common organization to coördinate the working of the various railway systems; (2) it set up a financial mechanism, with the coöperation of the railroads and the State, to insure a balance between railway receipts and railway expenditures; (3) it contained provisions in regard to railway workers and the settlement of railway labor disputes.

In order to effect the coördination and coöperation provided for, while each railroad retains its own internal organization, two new bodies, a Managing Committee and a Conseil Superieur, including the former, were created.

The Managing Committee consists of two directors from each of the five privately owned companies elected by the respective Boards of Directors; the General Manager of each of these five companies; the General Manager, President, Vice President of the Managing Body of the State Railways, and the Director of Control of Railways as a government member. This Committee meets regularly and considers all questions affecting the railway system as a whole, especially measures for securing technical coördination and for the unification and simplification of the rate structure. Resolutions of the Committee taken by majority vote with each system having one vote and the Director of Control the deciding vote are binding on all of the systems. If, however, any system thinks that its interests have been adversely affected by a decision of the Committee it may demand a further consideration from the Conseil Superieur. If necessary, such claims are settled by arbitration.

Considerable coördination of activities is achieved by this group who are actively engaged in railway management. In addition and of more importance there was created the Conseil Superieur, which is broadly representative while the scope of its activities is rather extensive. It is composed of a President and sixty members as follows: eighteen are members of the Managing Committee; twelve are representatives of the workers, two from each system elected by ballot with proportionate representation; the remaining thirty members are chosen by the Minister of Public Works from recommended lists. Of the thirty appointed by the Minister of Public Works, seven are government officials representing public works, finance, war office, and commerce and industry; seven are members of Chambers of Commerce; five represent agricultural associations; three represent shipping com-

panies; and four are from tourists, press, and travelers associations. The Conseil Superieur as constituted must consider all questions of common interest to all the railway systems; it may also advise on all important questions affecting one or more railway systems. Decisions are by majority vote, but are not effective unless two-thirds of the members representing the public interest are present. The Minister of Public Works has veto power, but can give a final veto only after the Conseil has considered a matter a second time. Decisions duly arrived at have the force of law. As to the scope of its authority, the Conseil Superieur has jurisdiction over all concessions for new lines; all programs for additional works, including electrification; authorization of issuance of railway bonds; general working regulations; rates and fares, and agreements with foreign railroads. It is the Conseil which must adjust rates to expenses in accordance with the financial provisions of the law. These financial arrangements represent a new principle of railway control in force—an attempt to pool the resources of the systems without pooling all their receipts, and to create a mechanism which will insure a balance between receipts and expenditures on all the railroads.[4]

The policy is based on the recognition that some of the systems will always be less profitable than others, and a desire to make the railroads as a whole pay for this, while keeping a separation of accounts as between the systems. This is to be accomplished by the creation of a common fund, in the books of the Treasury, into which are paid the surplus receipts of profitable railroads and from which railroads which sustain a deficit may draw, in case of need; advances may be made to this fund by the Treas-

[4] Ida Craven, "The Conquest of the Railroad—History of the French Railroads," an unpublished manuscript, p. 93.

ury, but must be repaid as rapidly as possible. The fund is to be kept in balance by the raising or lowering of railway rates.

The law specifies in detail what proportion of its gross receipts each railroad shall keep to cover expenses. These sums cover actual working expenses, as defined in existing agreements, deficits on joint financial enterprises, some special sums for each road, and the actual charges of its subscribed capital and loans. Thus the old guaranteed interest provisions reappear in the new law as fixed expenses for the companies. In addition to these sums covering working expenses and interest, each company may receive an annual bonus, to be divided among the managers and employees, for the improvement of operating results, as judged by standards laid down in the law. New construction—on which the State is to bear four-fifths of the cost and the railway companies one-fifth, in view of the ultimate reversion of the concessions—is to be financed by issuing new bonds, uniform for all the companies with provisions for sinking funds not exceeding sixty years. The interest on such bonds becomes an expense for the company for the duration of the concession, and a charge on the State if it takes over the railroads. For each system, then, any surplus of receipts above those specified sums is to be paid into the common fund, any system which has sustained a deficit is to be aided from the fund. The law lays down certain special provisions for the revision of rates within the first six years of its passage, because of the unusual economic conditions, which were expected to prevail. After that period, whenever the net excess received by the fund in any year exceeds the maximum fixed by the Minister of Public Works in consultation with the Minister of Finance, such excess reverts to the Treasury.

In such a case, the Conseil Superieur may lower all or some rates. Similarly if the common fund continues to sustain a deficit, all rates may be raised. Any sums in the fund at the expiration of the concessions are to be turned over to the Treasury. Some flexibility is given to this mechanism by the authority which the Minister of Public Works has to lower or raise all or some rates immediately in case of an emergency. Apparently the Minister may decide when an emergency exists. Various provisions of the law specify such things as the conditions of purchase of a railroad by the State, concessions for new lines, arrangements for grouping equipment acquired during the War, and the authority of the Minister of Public Works to admit the Alsace Lorraine system to the company organization when he deems such action desirable. For a time there was a question as to whether the Alsace Lorraine lines acquired as a result of the Treaty of Versailles should be divided between the systems of the Nord and Est, or should be kept as a separate system. The latter alternative was decided upon and the Alsace Lorraine system was admitted to the company organization in March, 1923, with a proportionate increase in the membership of the Managing Committee and of the Conseil Superieur. This action brought to France about 1400 miles of railroad. There are now seven systems in France with a total of 26,500 miles. Five of the systems are privately operated and two, the Western Railway and the Alsace Lorraine system, are operated by the Government.

The Swiss Government undertook the first step toward an International Railroad Convention. It is easy to see why technical uniformity and some arrangements for international through traffic were of importance to the railroads of Switzerland. In 1878 a conference was held

RAILROADS OF FRANCE

For the Year Ending December 31, 1926

Item	Private Railroads	State System	Alsace & Lorraine
Average miles operated	19,046	5,632	1,408
Capitalization or cost of construction [a]	{$6,583,736,139 { 1,106,170,009	$1,433,745,309 240,891,498	....
Capitalization or cost of construction per mile [a]	{316,700 { 53,211	254,571 42,772	....
Employees and equipment:			
Number of employees	365,583	94,146	43,922
Number of locomotives	14,785	4,321	1,700
Number of passenger cars	24,138	7,830	3,838
Number of freight cars	412,052	86,657	47,624
Services:			
Passengers carried—all classes	514,474,118	193,234,431	76,052,079
Passengers carried—first class	8,445,868	15,582,909	284,051
Tons of freight carried	228,823,995	37,977,641	58,952,830
Tons of freight carried one mile	22,985,006,726	2,776,356,217	3,021,664,312
Train miles	204,501,255	42,381,431	19,532,125
Locomotive miles	247,257,218	52,919,941	25,636,286
Results of operation:			
Operating revenues [a]	{$1,973,208,502 { 331,529,700	$379,364,433 63,739,122	$194,168,486 32,623,324
Operating expenses [a]	{ 1,445,005,507 { 242,783,386	330,200,951 55,478,893	151,760,797 25,498,173
Net operating revenues [a]	{ 528,202,995 { 88,746,314	49,163,482 8,260,229	42,407,689 7,125,151
Operating ratio—per cent	73.23	87.04	78.16

RAILROADS OF FRANCE—*Continued*

For the Year Ending December 31, 1926

Item	Private Railroads	State System	Alsace & Lorraine
Charges:			
Passenger revenues [a]	⎧$ 456,018,801 ⎩ 76,618,247	$95,068,155 15,972,928	$24,402,122 4,771,998
Average receipts per passenger—all classes [a]	⎧0.88 ⎩0.15	0.49 0.08	0.37 0.06
Average receipts per passenger—first class [a]	⎧8.66 ⎩1.45	0.62 0.10	5.35 0.90
Average receipts per passenger mile—all classes [a]	⎧3.476¢ ⎩0.584¢	2.879¢ 0.484¢	2.578¢ 0.433¢
Average receipts per passenger mile—first class [a]	⎧ ..... ⎩	4.314¢ 0.725¢	9.039¢ 1.518¢
Freight revenue [a]	⎧$1,210,814,984 ⎩ 203,435,783	$206,869,199 34,757,241	$148,022,151 24,870,022
Average receipts per ton mile [a]	⎧5.266¢ ⎩0.885¢	7.450¢ 1.252¢	4.903¢ 0.824¢

[a] Computed at both normal and average rate of exchange. The upper and larger figure is at the normal rate of 19.3¢ per franc, while the lower and smaller figure is at the rate of 3.2427¢ per franc, which was the average rate of exchange prevailing during 1926.

Sources: Private lines, Revue Generale des Chemins de Fer, August, 1927.
State System, Chemins de Fer de l'État, Rapport, 1926.
Alsace & Lorraine System, Chemins de Fer d'Alsace et de Lorraine, Rapport, 1926.

at Berne to which came railway officials from Switzerland, France, Germany, Austria Hungary, and Italy. They discussed technical questions and the possibility of drawing up an international freight treaty. Further conferences were held at Berne in 1882 and 1886. The treaty dealing with international traffic drawn up in these conferences, was ratified in 1890 by the Governments of Austria Hungary, Belgium, Bulgaria, France, Germany, Greece, Holland, Italy, Luxemburg, Roumania, Russia, Serbia, and Switzerland. This treaty which had the force of law and could be enforced by the courts of member countries, governed all shipments of goods from or through one State to another with the exception of articles monopolized by the post offices of the various States. It provided for uniform through bills of lading, prescribed routes for international traffic, fixed liability in case of delay and loss, and prohibited special contracts which were not publicly announced. The central bureau to supervise the administration of the provisions of the treaty was established at Berne. This bureau gathered information of importance for international traffic, investigated the financial status of railroads engaged in such traffic, and did work preliminary to the conventions which were called from time to time to work out modifications of the treaty. These conventions of Berne were abrogated during the World War but have since been renewed.[5]

A certain degree of technical uniformity on all European railroads was not difficult to obtain. In 1890 all of the railroads of Europe except those of Russia and Spain used the standard gauge of 1.445 m. This was the result of the work of engineers trained by Stephenson and the fact that many continental countries copied the methods

[5] "Chemins de Fer, 1928—Year Book," pp. 401-443

of Stephenson's lines. The Russian roads were built by English engineers who preferred the wide gauge. At present Spain is introducing the standard gauge for all lines in that country.

In 1911 an attempt was made to draw up agreements as to uniform standards for the construction of freight cars. In 1919 the Italian railroads called a conference to discuss the common use of cars. At a second conference in 1921 there was formed the "Union Internationale des Wagons" which supervised the reciprocal use of cars. The administration of the Swiss Federal Railroads Service is the permanent organization for this service.

The Geneva Economic Conference of 1921 requested the French railroads to call an international railway conference in Paris. In response to this request a conference was held in Paris in October, 1922, at which twenty-six countries and forty-six railway administrations of Europe and Asia were represented. The League of Nations was also officially represented. This conference created a new permanent organization, the "Union Internationale des Chemins de Fer." The members of the Union Internationale des Chemins de Fer are the administrations ot the originating railroads, and any other administrations operating lines of at least 1000 kilometers which they wish to admit. Other transport undertakings having international relations may participate as "adherent administrations." There is here the possibility of the development of an international transportation union. This organization is composed of a General Assembly which meets periodically and a Managing Committee which meets twice a year with a permanent Secretariat at Paris. The Assembly General names the countries which for ten years shall send the representatives who are to be members of the Managing Committee. At present

these countries are France, Germany, Great Britain, Italy, Austria, Belgium, Poland, Roumania, Sweden, Switzerland, and Czechoslovakia. In addition to this administrative organization the Union Internationale des Chemins de Fer has an organization for study composed of five permanent commissions each headed by a representative from one country, that country chosen by the Assembly General for five years. The Commissions and their present chairmen are:

1. Commission der trafic-voyageurs—Germany.
2. Commission du trafic marchandises—Switzerland.
3. Commission des décomptes et changes—Belgium.
4. Commission d'échange du matériel roulant—Italy.
5. Commission des questions techniques—France.

These commissions have already worked out a number of agreements. One of the most difficult questions before the Technical Commission was the choice of an automatic brake to be used on the railroads of all members of the Union. The Commission for passengers has gone far toward working out the form for a uniform international rate scale for passengers. Agreements arrived at by the Commissions must be voted upon by the whole assembly. Decisions of the Assembly are binding if four-fifths of the total number of votes in the conference are cast for them and there is not a subsequent objection from ten per cent of the members and if the Governments of the administrations concerned do not refuse to sanction them. No rate agreements may be forced on a member against its wish.

SPAIN

The present railway system of Spain consists of trunk lines radiating from Madrid with smaller lines connecting the radials. One would expect this, given the contour

of the country, the central situation of the capital, with seaports almost equidistant round its long coast line. But because these principal trunk lines were made up of local lines which already did a thriving business, and because lines running through mountainous and unpopulated districts would be unprofitable though shorter, there is a notable lack of direct communication between Madrid and the large seaports. For instance, Valencia is only one hundred and eighty-three miles from Madrid, as the crow flies, but by rail it is three hundred and four miles.

At the time England was opening railroads, Spain was engrossed in a long and cruel civil war. It was not until 1844 that attention was seriously given to the possibility of substituting railroads for stagecoaches. British capitalists and engineers were the first to awaken interest in railway communication in Spain, but the earliest concession went to three Spaniards, one a resident of London. The line was to run from Barcelona to Mataro. Joseph and William Locke were the first engineers, and Mackenzie and Brassey were the contractors. Although all the capital had not been subscribed, the line was opened in 1848 and was an immediate success. The first year it carried 700,000 passengers and paid a dividend of twenty-two per cent.

In the meantime, in 1844, five other provisional concessions were granted for lines radiating from Madrid. The same year a commission was appointed to report upon the legislation necessary to regulate railway concessions and working. Their report served as the basis for railway laws until after the World War. Although there was a boom in railway shares following the opening of the Mataro line, construction proceeded slowly and, down to 1913, the average annual addition to the

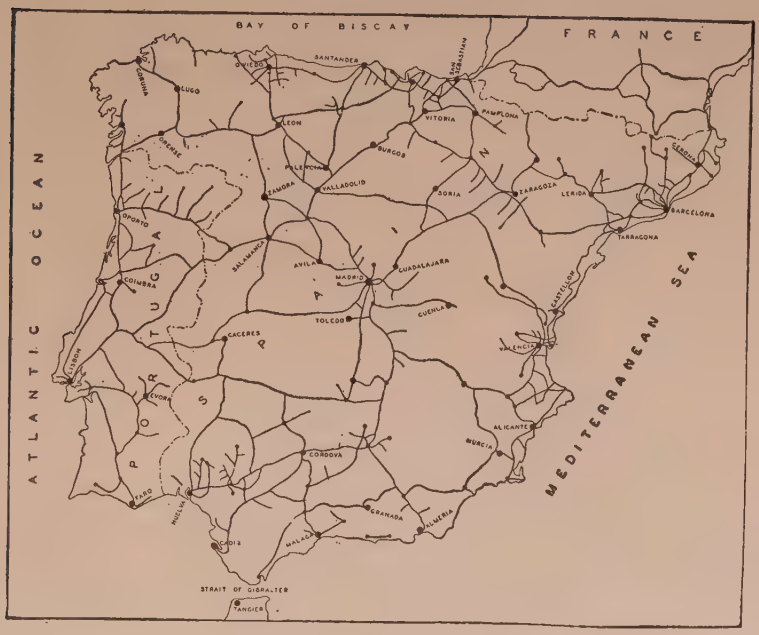
railway mileage of the country was only ninety miles.

At the close of the War, nearly half the railroads were owned and operated by two companies, two other roads had fair mileage, and the rest of the mileage was divided among about eighty companies. There were 9260 miles of broad and narrow gauge railroads, of which the Northern Railway Company owned 2295 miles, the Madrid, Saragossa, and Alicante, 2276 miles, the Andalusian, 1003 miles, and the Madrid, Caceres, and Portugal, 482 miles. There were 100 miles of railroad worked at a loss by the Government. These were the lines of small companies for which the concessions had lapsed and the property reverted to the State. The three large companies are of French origin and about half their capital is French. Each company has two boards of directors, one in Paris and one in Madrid. Among the small companies, some are French, some British, and one was of Belgian origin.[1]

The history of the four principal lines is typical of all the railroads of Spain. The Northern Company was formed in 1858, with a concession to run a line from Madrid to Irun on the French frontier. In 1878 the company acquired the Barcelona-Saragossa-Pamplona Company and in 1890 and 1891 further extensions were effected by the purchase of the Asturias Galicia and Leon Company's lines and those of the Almansa-Tarragona-Valencia Company. At about the same time the railroad and mines of San Juan de las Abadesas were included. During the first years of the company's life, dividends of as much as six per cent were paid. But from 1865 to 1873, and from 1891 to 1906, no dividends were declared. The increasing prosperity of the country, and

[1] The Central Aragon was Belgian, but in 1926 it was purchased by the Northern Railway Company.

the repudiation of the gold basis, enabled the company to pay dividends in pesetas until 1917, when the increased costs incident to the War again caused a serious drop in net revenues.



Railroads of Spain and Portugal

The Madrid, Saragossa, and Alicante was organized in 1857 to take over three concessions. It acquired several more small undertakings and in 1898 rounded off its system by purchasing the 448 miles of the Catalonian system. Since then the company has not passed a dividend.

The Andalusian Company was projected in 1869, but did not start working until 1877, when it bought a short line. Through amalgamations and purchases, the system eventually acquired a practical monopoly in the south-

west corner of Spain. In spite of its monopoly of traffic in one of the most fertile regions of Spain, the Andalusian has never enjoyed the prosperity of its larger neighbor. While the lines were new and renewals small, the company was fairly prosperous. However, in 1892 there was no money to meet debenture interest. In 1900 and 1904, stock was issued in lieu of interest. From 1910 to 1917, interest and a small dividend were paid each year.

The Madrid, Caceres, and Portugal received its concession in 1880 and in 1895 amalgamated with the Western of Spain. A subsidiary company was formed to furnish the necessary capital and for fifteen years its shareholders received a small return every year, until 1917 and 1918. The shareholders of the amalgamated concerns are in a worse plight than those of the other three companies, for they have received no dividends.

The outstanding feature of the financial structure of the railroads of Spain is the very large proportion borne by debentures or loans to share capital. In the three largest companies the shares are only one-third and one-fourth of the debentures. The original cause of this was, no doubt, the competition prevailing prior to 1890 when there was a struggle to extend respective spheres of influence, each company striving to obtain small lines at any cost to keep its competitors out of a desired district. The effect has been to burden the balance sheet with the debts of many small branch lines running through country with a limited traffic and requiring large expenditure in renewals and maintenance. The consequence is that the large companies now find themselves strangled by enormous first charges and in spite of a very low operating ratio, which is well under fifty per cent in normal years, they are unable to pay decent

dividends to their shareholders or to put aside the money required for extensions to meet the growing traffic requirements. The companies are overcapitalized and cannot command new capital for the rolling stock, double tracking, and extensions that are needed. Their only means of making betterments is by using money which might otherwise go into dividends, and this very curtailment of the dividends further limits the credit of the companies.

While in Spain there were no guarantees of interest or net earnings after the period of construction, the State during the period of construction followed a policy of paying a fixed sum or an amount per kilometer as a subvention, with the condition that the company should revert to the State at the end of a given period, generally ninety-nine years. This policy brought about the construction of a number of roads during the last century, not all located with the wisdom one might wish. Between 1900 and the close of the War only some 1000 kilometers of narrow gauge had been laid in spite of special legislation which had been introduced in an effect to encourage railway construction.

In spite of the unfortunate circumstances of the companies and their shareholders, the railroads have been a veritable gold mine as far as the Government was concerned. The Northern Company alone in 1918 collected on behalf of the State nearly fourteen million pesetas and paid direct taxation of seven million pesetas, while in free carriage of mails and other national transports it was computed that the State saved over six million pesetas. The total saving to the Government would have paid a ten per cent dividend to the stockholders. Further it represented a return of seven and a third per cent on the original subventions. This calcula-

tion applied equally to all railroads. Moreover, in a relatively short time the State was expected to come into possession of a complete system of railroads in working order. The State exercised its right of intervention constantly, probably to a greater extent than any other country, except France and India. It maintained a very extensive service of inspection. In addition the State has not always been the best creditor, for some of the companies have outstanding large sums for transport effected at the time of the Cuban War.

When the price of coal and materials increased as a result of the War, the companies asked to be allowed to apply a surcharge on the tariffs, which were fixed in their concessions. Their request was refused until late in 1918, when the railwaymen threatened to strike. The Government then authorized a fifteen per cent surcharge on condition that two-thirds of the proceeds should be dedicated to advancing the pay of the men, and that such proceeds should not be applied to payment of dividends or interest. Subsequently a further program was submitted by the workers and as the companies maintained that they would be unable to grant further increases, the men left work in March, 1920. A strike of twenty-four hours' duration was settled by the promulgation of a hurried Royal Decree in which the Government undertook to meet the men's demands, such advances to be repayable by the companies when the net receipts exceed those of 1913. The increased pay thus conceded was on a scale varying between sixty per cent and one hundred and fifteen per cent according to rating, these figures including the increase already granted in 1918. The new rates of pay averaged about one hundred per cent for all grades over 1914. In October, 1920, the Government was authorized to advance sums required by companies for

new rolling stock, repayable with interest at five per cent in twenty yearly installments.

The Military Directory came into power on September 13, 1923. One of its first acts was to order an investigation into the financial position of the companies with a view to stopping or reducing the advance for wages which constituted a heavy drain on the national exchequer. It also reappointed the Superior Railway Council of seventeen members, six representing the railroads, six the State, four the traders, or users of railroads, and one representing the workers. One of the Council's duties was to formulate a plan of salvation for the railroads. The Council eventually reported in favor of a modification of the 1922 scheme. Their suggestions were accepted and the new law came into force July 12, 1924.[2]

The new statute is based on a kind of consortium or copartnership of the companies and the State, the latter to provide capital for the new lines, extensions, and improvements. The law provides that the old statutory maximum charges shall disappear and tariffs shall be readjusted to cover working costs, first charges, and a reasonable interest on that part of the ordinary capital which shall be declared unburdened by mortgage. For the fixing of tariffs a valuation of the capital is a necessary preliminary and this, the statute orders, shall be agreed at a figure between the book cost of the property on one hand and its earning power on the other, the latter assessed on the average of the last fifteen years capitalized at four and one-quarter per cent. Elaborate rules are laid down for the proportional distribution of profits and provision is made for regrouping. As regards the future supply of materials expected to arise out of the proposed railway loan, it should be noted that under the

[2] *Railway Gazette,* August 28, 1925, p. 272.

new régime all railway purchases will be subject to the Protection of National Industries Law of 1907 and preference will be given to contractors within the country.[3]

With the exception of the Central Aragon, practically all the broad-gauge lines applied for admission to the scheme and submitted programs for extensions and improvements. Paradoxically the only new construction of any importance to be undertaken for many years past is now being executed by British interests [4] quite independently of the new railway régime and paradoxically, also, the three principal companies are issuing new capital and carrying out improvements on their own accord and without waiting for the operation of the new statute.[5]

The Central Aragon was one of the most prosperous Spanish railroads, due primarily to the large subventions during the period of construction and to the general prosperity of the zone through which it passed. In 1924 it decided to stay outside the consortium and it was able to carry on without financial assistance or increase in statutory charges. The line was three hundred kilometers in length, mostly single line. The road had paid dividends of five per cent for several years and the distributions on the ordinary and preferred shares for the four years ending 1925 were 6, 7, 8, and 10 per cent. The acquisition of this road by the Northern was the first sign of regrouping under the new régime. However, there was

[3] *Railway Gazette,* August 28, 1925, p. 272.

[4] This line, the Santander-Mediterranean, was to be 250 miles long, costing £10,000,000 sterling. In May, 1927, it was said that the British company had made a further appeal to the Government to release it from its undertaking to work the line. It offered to construct the railroad and hand it over to the Government on certain terms. The provincial authorities, who first held the concession, protested; but it seemed extremely doubtful whether the line would ever be worked or even finished if the Government did not agree to the terms.

[5] *Ibid.,* August 28, 1925, p. 272.

apparently no pressure exerted by the Government to bring this about, and it is thought that one important factor in the sale was the considerable difference in exchange between the two currencies.[6] After the sale, the Belgian directors all disappeared, the new board was formed of directors of the Northern supplemented by the Managing Director and the Deputy Manager of the Northern. Otherwise the staff remained as it had been under the Central Aragon.[7]

In 1925, the new Spanish railway loan of 500,000,000 pesetas proved a decided success. The loan was the first installment of an issue of special railway stock authorized under Royal Decree of July 23, 1925, to the amount of 2,600,000,000 pesetas, carrying five per cent interest, free of income tax, and redeemable within fifty years. It was said that 410,000,000 pesetas were to be utilized for the purchase of rolling stock and locomotives and for improvement of existing lines; 60,000,000 were to be absorbed by lines under construction; and 30,000,000 pesetas were to be expended in new construction.

In 1926 the Joint Sub-Committee of the Superior Railway Council reported against any increase in tariffs except that the surcharge of fifteen per cent authorized in 1918 was to remain. The "transitional period," and with it the subvention for wages, was deemed to have ceased on June 30, 1926. From that date during the "provisional period" which is to endure until the end of 1928, the State is to guarantee the average earnings of the past three years within and not exceeding a limit for 1926 of eighty per cent of the subvention received in 1925, for 1927, sixty per cent, and for 1928, forty per cent. The guarantee is further limited by the average ratio of operation so as

[6] *Ibid.*, October 1, 1926, p. 392.
[7] *Ibid.*, November 5, 1926, p. 547.

to reward efficient working. Surplus receipts are to repay past advances.

One thing is certain, and that is, that the Commercial Section of the Superior Council, after several months' intensive work had to abandon the idea of a general revision of tariffs, which as all railwaymen foresaw was not the easy business it appeared to the authors of the railway law of 1924. Now it is a moot point to what extent the Government is keeping faith with the companies, as the statute which became law on July 12, 1924, clearly states that the tariffs shall be adjusted to cover working costs and a reasonable interest on capital. The positive obsession against making the railway user pay for the service has again prevailed, and the condition under which the companies were induced to enter the so-called "new régime" is in danger of being forgotten. The trading community has its cheap railway transport, and continues to complain that it is defective, while at the same time its representatives fight against any attempt to improve conditions by bettering the financial status of the companies.[8]

What of the service which these troubled roads are giving to passengers? Probably there is no more luxurious train in the world than the famous "Sud Express." But let the traveler get off the main lines of tourist travel and he is doomed to spend long hours in comfortless carriages with frequent changes at mysterious junctions where nothing seems ever to happen.

Furthermore, to visitors particularly, the service between the seaports and Madrid seems slow and infrequent. From whatever point one approaches the great central plateau of Castile there is a heavy climb and the severe grades make high speeds impracticable. None of

[8] *Railway Gazette,* July 23, 1926, p. 206.

the main trunk lines have ever had a traffic sufficiently productive to warrant heavy expenditure on improved location and the consequence is a low average of speed. The Valencia-Madrid question is typical of many of the

RAILROADS OF SPAIN

For the Year Ending December 31, 1924

Item	Private Railroads
Average miles operated	9,614
Equipment:	
Number of locomotives	3,325
Number of passenger cars	6,260
Number of freight cars	72,335
Services:	
Passengers carried—all classes	118,419,289
Tons of freight carried	47,832,132
Results of operation:	
Operating revenues [a]	{$167,695,175 { 115,887,792
Operating expenses [a]	{ 113,974,868 { 78,763,720
Net operating revenue [a]	{ 53,720,307 { 37,124,072
Operating ratio—per cent	67.97
Charges:	
Passenger revenues [a]	{$ 44,126,887 { 30,494,422
Freight revenue [a]	{ 100,325,096 { 69,330,879

[a] Computed at both normal and average rate of exchange. The upper and larger figure is at the normal rate of 19.3¢ per peseta, while the lower and smaller figure is at the rate of 13.3375¢ per peseta, which was the average rate of exchange prevailing during 1924.

Source: Bulletin des Transports Internationaux par Chemins de Fer, June, 1926.

radiating lines in Spain. At first sight it appears as if existing communications were lamentably inadequate, but the fact is that the traffic is not sufficiently intensive to support a double-track through route, over country which does not offer a prospect of local business. At present there are only three trains a day each way carrying passengers and one of these is a mixed train. Discounting

local traffic, all the Valencia passengers could be carried on less than two trains a day each way, and yet for years there has been a perennial campaign in favor of a double-track, direct route, with electric traction, and built to allow speeds of fifty miles an hour.[9]

There is another feature of these radial lines which is a factor in the problem of whether it is really necessary to improve communications with the capital. Nearly all the trunk-line expresses run at night and the Spaniard is accustomed to night travel. Trains leave the coast or the capital at night and arrive at their destinations on the following morning. What advantage would there be in faster service? Moreover, the poorer classes who do not use the sleeping cars are not averse to saving their hotel bills by sleeping on the train. Speeds nowhere exceed forty miles an hour on the main lines, and they average about twenty-five miles an hour on the local railroads where the trains stop at every roadside station.[10]

[9] G. L. Boag, "Railways of Spain," pp. 22-23.
[10] *Ibid.*, pp. 23-25.

CHAPTER IV

CENTRAL EUROPE AND ITALY

GERMANY

STUDENTS of government ownership of railroads quite frequently refer to German experience as being of particular significance. At the time that railroads began to be built, the smaller States in Germany were regarded as the personal property of their respective sovereigns. Quite naturally the princes of these countries built or considered building railroads for the development of their estates. During the first years of railway building in Germany there was a marked tendency for private capital to furnish roads in the more commercially developed parts of Germany. In the more backward agricultural districts the States built railroads. After the Franco-Prussian War, there was a decided change in railway policy throughout the German States. Bismarck was at the helm as the empire builder, and he conceived of the railroads as an important adjunct of the Government. He thought that the earnings of the railroads might contribute to the public treasury, while the roads might be operated with political and military considerations as determining factors in their management. The Southern German States were not particularly happy over the aggrandizement of Prussia, and rather than have the railroads within their borders acquired by the empire in furtherance of Bismarck's plan, such States as Bavaria

and Saxony took over for themselves the private lines within their borders.

Under Bismarck's leadership, Prussia acquired Prussian lines for the Prussian Government. In 1879 the Minister submitted to the Prussian Parliament a memorandum in support of the nationalization of railroads in which was stressed the military advantages of state railroads, the greater possibilities for developing trade under state operation, and the abuses inseparable from private management.[1]

Sir William Acworth took up each of these abuses alleged to be inseparable from private management and showed that they are equally characteristic of state management. Among these abuses which the Prussian Minister attributed to private management were, first, the existence of numerous concerns of doubtful solvency and restricted capacity of service; second, abuse by private companies of their privileged position; third, opposition to desirable reforms; fourth, complicated and arbitrary variations in their methods of organization; fifth, chaos of tariffs; sixth, quarrels and waste resulting from the fierce competition of numerous separate administrations. Sir William Acworth showed, by citing the experience of Germany and other governments operating railroads, that these allegations of the Prussian Minister of 1879 were far from being established. The advantages of a single unified system had been summed up by the Prussian Minister as follows: 1. Avoidance of the construction of competing lines; 2. The reduction of the numbers of officers and staff and the amount of correspondence; 3. Unification of tariffs and train schedules; 4. Simplification in dealing with damage claims; 5. Provision of inter-

[1] W. M. Acworth, "Historical Sketch of Government Ownership of Railroads in Foreign Countries," p. 8.

change stations; 6. Better use of equipment; 7. Avoidance of duplications of service and of roundabout routing of traffic resulting in higher operating costs and consequently higher rates. Whether or not these advantages were realized under government ownership in Germany

Railroads of Germany

is not so clear. It is apparent that Bismarck acted from political motive.

What have been the results of government ownership and operation of railroads in Germany? One would expect, under German management and with the German genius for organization and particularly in view of the successful efforts of the Government to make the railroads contribute to the public income, that government ownership and operation in Germany would produce a lower operating ratio than private management in France. This is the more to be expected when we compare the

operating conditions in France and Germany before the World War. Germany is rather flat, whereas much of France is hilly. As for supplies, both coal and steel were for many years cheaper in Germany. Traffic density was higher in Prussia than in France. With this great advantage in traffic density Prussian mileage was 29,000 and French 25,000. The charges for service in the two countries were substantially identical. Prussia had a higher proportion of straight carloads, loaded and unloaded by the shipper, than was the case in France. Wages in France were as high or higher than in Prussia. In France larger expense was incurred for benevolent purposes and French responsibility was greater than German in connection with the movement of freight and liability in its handling. France has had a larger proportion of passenger traffic which was less profitable than freight traffic. In view of these comparisons, and considering that with her highly developed bureaucracy Germany was so admirably fitted for government operation of railroads, we would expect the operating ratio of Prussian roads to have been much lower than that of the roads of France.

OPERATING RATIOS

	1900	*1910*	*1911*	*1912*	*1913*
	%	%	%	%	%
France	54	60	62.5	63	63
Germany	62	67	65	66	66

There was a lessening of the difference between the operating ratios in the two countries during the last few years before the World War. This was due to the fact that France had acquired the Western, and as a result of the mounting costs of operating the Western under government ownership there was a very appreciable increase in the average operating ratio for all the French lines. The operating ratio for the five French private lines was 58.5

per cent in 1913, the difference between that and the Prussian average being seven or eight per cent.

While the French showed a lower operating ratio, they also made a better showing with respect to reduction of freight rates for some ten years before the World War. Germany made a very small reduction in freight rates. The ton-mile receipts varied between 1.37 cents and 1.34 cents for a decade. During the same period in France there was a reduction in freight rates of 11 per cent; that is, from 1.45 cents to 1.3 cents per ton mile.

Political considerations have played an important part in the operation of German railroads. For example, traffic was diverted by exceptional rates from Rotterdam and Antwerp for the benefit of Bremen and Hamburg. A natural route from France to South Germany and Austria is through Alsace Lorraine, but this route was barred by fixing a scale of rates *to* the frontier different from that *from* the frontier.

The German Government adopted another policy, that the establishment of land and water routes within the empire should be in the interest of the public defense and of the development of general traffic. Consequently railroads which were considered necessary either in the interest of defense or of general traffic could be established at the expense of the State even though the members of the Reichstag through whose district the proposed road would pass might object.

Whatever may be said of government success or failure in managing the roads in Germany as a business enterprise, they proved to be a very important factor during the World War. The German Government used the railway system as a part of the military equipment necessary to the functioning of the army. They were able to transport the same troops again and again from the East

front to the West front in accordance with orders of the high command. This use of German railroads during the World War no doubt enabled one army to do the work of two. On several occasions these troops could be thrown into action on the West front, and during a lull and when needed these same troops could be transported very quickly to the East front. However, the privately owned lines of France, England, and the United States and Canada were used as effectively for military purposes as if they had been owned by the Government. Some of the German roads, no doubt, would not have been built along the exact routes they follow, if the routes had been left to the determination of the owners of private capital, for the routes of some of the German roads were determined by military considerations.

In Germany, as in other countries which participated in the World War, railroads were subjected to terrific strain. There was great wear and tear. Cost of operation rapidly increased, and after the end of the War and the changes in the Government of Germany, the roads for a time showed the effect of the general demoralization of business throughout the country. Under the Dawes plan the German railroads, though still owned by the Government, are to be operated for profit, and an effort made to have them contribute toward the success of the plan under which Germany is to make reparation payments. Railroads are to be administered by the *Deutsche Reichsbahn-Gesellschaft;* that is, the German State Railway Company. The factor primarily considered in the reorganization of the railway management under the Dawes plan is earnings. Under the Act of August 30, 1924, if they should fail to set aside certain amounts, there would be danger of a weakening or even of a complete loss of German control of railway administration. While own-

ership still remains vested in the State, the German State Railway Company operates the railroads in its own name, for its own account, and to a certain extent is trustee for the State until reparation obligations are discharged. The management of the company is vested in a Board of Directors and a Board of Managers. The burdens imposed upon the company under the plan for making the roads contribute to reparation payments will be so great as to deny to the company the advantages that ordinarily accrue to private management. The German State Railway Company operates 33,142 miles of line, constituting the largest system under a single manence of this private management of so large a system, agement to be found in the world. A few years' experibeing virtually a monopoly so far as rail transportation is concerned, should be most enlightening, particularly if the management be given freedom comparable to that exercised by private management in Great Britain and the United States. The calendar year 1927 embraced the last two-thirds of the third and the first third of the fourth reparation year. 1927 is the first standard year in which the six hundred and sixty million gold marks as interest and amortization on the eleven billions of promissory notes issued by the National Railways is to be written off as provided by law. Including two hundred and fifty million marks transportation tax, the national lines of Germany in 1927 paid out over one billion marks toward interest, sinking fund, dividends, and taxes. During the year rates were reduced so that revenues were lessened about seventy-five million marks. Wages were increased to the amount of about four per cent of the total expenses.

German railroads are feeling the competition of motor vehicles on the highways. This is so serious as to call for

consideration in 1928 of measures which should end unsound competition by coördinating railway and highway service, assuring the national railroads of considerable influence over highway traffic.[2]

RAILROADS OF GERMANY

For the Year Ending December 31, 1926

Item	Deutsche-Reichsbahn Gesellschaft
Average miles operated	33,142
Capitalization or cost of construction	$6,188,000,000
Capitalization or cost of construction per mile	187,095
Employees and equipment:	
Number of employees	707,570
Number of locomotives	26,474
Number of passenger cars	63,476
Number of freight cars	670,307
Services:	
Passengers carried—all classes	1,819,411,751
Passengers carried—first class	630,814
Tons of freight carried	420,937,241
Tons of freight carried one mile	44,372,617,604
Train miles	353,923,623
Locomotive miles	601,601,065
Results of operation:	
Operating revenues	$1,080,710,638
Operating expenses	875,973,756
Net operating revenue	204,736,882
Operating ratio—per cent	81.06
Charges:	
Passenger revenues	314,201,650
Average receipts per passenger—all classes	0.28
Average receipts per passenger mile—all classes	1.180¢
Freight revenue	673,687,560
Average receipts per ton mile	1.518¢

Source: Geschaftsbericht der Deutschen, Reichsbahn Gesellschaft, 1926.

AUSTRIA

The railway policy in Austria has been both vacillating and improvident. At first the Austrian rulers looked with disfavor upon the railroads as a newfangled and

[2] Alwin Sperber, "Archiv für Eisenbahnwesen," *Railway Age*, January 7, 1928, p. 115.

radical device. It seemed to them that such rapid movement might even savor of revolution.[1] In 1836 the emperor signed a railway charter only on the ground that the thing could not maintain itself anyhow. After a few years the Government recognized the importance of railway construction and began to subsidize and build railroads. Before the revolution in 1848, about half of the railway mileage in the country was operated by the State. This revolution, which so disturbed the ruling houses of western Europe, and a war with Hungary, made such drains upon the government treasury that the rulers of Austria began to look for some source of ready money and for ways to reduce the obligations of the Government. The French at this time were encouraging construction and operation by private companies. Austria decided to follow the example of France and began to sell the state-owned railroads to private companies at very low prices. In 1875 of a total mileage of 6405 miles the States operated only 71 miles.

In the meantime the Austrian Government had continued to have very serious difficulties. Austrian armies had met defeat in wars with France and Prussia and military authorities believed that these Austrian reverses were largely due to the undeveloped condition of railroads in that country. Germany was already launched upon an era of government ownership and operation. Germany had been successful in defeating Austria and France. Austrian rulers decided to imitate the German policy of state acquisition of railroads. As a result of this policy, by 1906, out of a total of more than 13,000 miles, about 6200 miles of Austrian railroads were owned and worked by the State, and some 3000 miles owned by private companies were also worked by the State.

[1] Hadley, "Railroad Transportation," p. 214.

The reasons, then, for state acquisition of railroads in Austria were political and military. The State has not made a notable success in managing railroads. In 1906 there was a deficit on the state managed railroads of $16,850,000.[2] Austria has used government control of railroads to foster certain industries. For example, the beet-sugar industry in that country owed its importance mainly to its export trade, which at one time amounted to three-fourths of the entire output. This large export of sugar was made possible through reduced freight rates.[3] For five years preceding 1906 when the Kaiser Ferdinand Nodbahn was taken over by the State, the dividends of the stock of that road had averaged 12 per cent. In 1910 the railroad showed a deficit of $25,000,000. This was due in the main to a large increase in the number of employees and a great reduction in hours of labor, and the appointment of incompetent men to important positions.[4] Before the War the Austrian Empire carried out a policy of buying private railroads so that at the time of the dissolution of the Empire it had nearly all the important lines. The conditions were never favorable for obtaining good returns from the Austrian state railroads. So much mountainous country made railway construction difficult and expensive. A number of lines were built with the object of improving conditions in relatively unproductive districts.

Before the World War, while Austrian State railroads ordinarily earned enough to pay their operating expenses, interest and payments on invested capital had to be provided by subsidies from other forms of state revenue. Immediately before the War great expenditure was

[2] C. F. Beach and A. Segnitz, "Railways of Europe," *Moody's Magazine*, Vol. 8, p. 292.
[3] *Ibid.*
[4] W. M. Acworth, *op. cit.*, p. 17.

incurred in carrying out considerable improvements on recently purchased railroads. An extremely costly second line of railway communication with Trieste was also built.[5] After the dissolution of the Empire, what is now Austria found itself with only one-fourth of the former state lines in its possession. The most productive lines had gone to the other States. The expensive terminal stations at Vienna remained as a burden on the new State.

Immediately after the War the Austrian railroads were managed by the State in such a disorganized and uneconomic manner that the operating deficit grew to be more than one-half of the total government budget. After the conclusion of the War, the Austrian Federal railroads became responsible for the largest item in the annual deficit of the Austrian Government. The enormous losses in the operation of the railroads were traceable in the main to four factors:

1. The mountainous character of the country;
2. The fact that practically the total requirements of coal must be imported;
3. The surplus personnel;
4. The policies of the government management.

The lines which the Austria of to-day owns are overburdened with excessive capital expenditures for construction and are not profitable to operate because they cross unproductive mountain regions.

In 1926 an Austrian writer [6] pointed out that Austria now suffers considerably under disadvantages from a railway standpoint. More than half of the total railway

[5] League of Nations, p. 27.
[6] A. Niklitschek, "Austrian Railways Progress Slowly," *Railway Age*, January 2, 1927, p. 157.

mileage of 3675 miles in the new Austria is in mountainous districts. This makes for high operating expenses. These expenses are increased because air brakes are not in use and many brakemen are required on the freight trains. Wood is the principal rough commodity, there being very little ore and coal to haul. Passenger traffic is considerable, particularly during the tourist season,

Railroads of Austria

when many passengers are attracted to the Austrian railroads because of the great natural beauty of the country served by them.

It is well known that a large portion of the railway system of the former Austria-Hungarian monarchy now within the territory of the Austrian Republic was always operated at a loss, owing to the high percentage of mountainous track. In view of the fact that Austria's production of coal is practically negligible, fuel is a relatively large item of expense for the Austrian railroads. The country has only inferior brown coals and

lignite for locomotive fuel and must import coal for the railroads.

Austria fell heir to a great number of employees which the roads did not need. The administration of the Republic state railroads felt obliged to make use of thousands of employees who had to leave the territory of the States formerly members of the Austrian Empire. (Whereas expenditure on personnel of the former state railroads which had an extent of 19,000 kilometers amounted in 1913 to 421,000,000 crowns, the budget for 1919 and 1920 of the Austrian Republic provided for an expenditure of about 4,700,000,000 crowns in wages, although the system was so much smaller. Much of this financial difficulty was due to the poor credit of the Austrian Government and the depreciated value of the Austrian crown.)[7]

When the Republic of Austria was established it was apparent that an improvement in the desperate financial condition of the country would primarily depend on the elimination or at least a considerable reduction of the railway deficit. The political parties opposed a reform. The Social Democrats were strongly supported by the railway employees and feared that a reform would be accompanied by wholesale dismissals of railway employees, with a consequent loss of votes for their party. The other parties had similar interests or they acted as advocates for the selfish desires of the provinces for the maintenance of unprofitable lines and unnecessary local offices and for the continuation of low freight rates and passenger fares, all of which might be affected by a reform. The Government itself was not willing to lose its power over the railroads by placing them on a commercial basis. The numerous officials employed by the railroads feared dismissals on a large scale as a natural consequence of reform. This poli-

[7] League of Nations, pp. 28-29.

tical opposition was strong enough to prevent a rehabilitation for four and a half years, although it was unanimously agreed that reform was absolutely necessary.

By a law of July, 1923, an "independent" body was created to operate the federal railroads. This body is to administer the entire property of the federal railroads and to act as a trustee for the Government. Any deficit is to be supplied by the Government. The business is to be managed by an Executive Committee of five, which in turn shall be responsible to a Commission of Directors composed of fourteen members. Eleven members of the Commission are to be appointed by the Government for terms of three years and are required to be business men or experts in questions of transportation. Three members are to be elected and appointed by representatives of the railway employees. The Executive Committee is appointed by the Commission and may be recalled by that body with the consent of the Government or in compliance with a demand from the Government.

The Executive Committee has charge of the actual operation of the railroads, of the establishment of an annual economic program, and the determination of the annual budget. It passes on questions of reorganization and appoints and assigns officials to their duties. The Commission of fourteen directors is charged with the general supervision of the business. It has to safeguard the public interest, to examine and approve the budgets, and to enforce compensation claims against the Executive Committee. It is authorized to appoint and to recall that Committee.

The Government reserves to itself the right to give or to withhold final approval in the case of fundamental tariff amendments and loans of importance. The Government further reserves to itself the right to supervise

social and safety measures and to regulate construction and maintenance.

From this account of the provisions of the law of 1923, it is clear that the railroads are not removed from the influence of the Government, since at any time the Government may demand the removal of a member of the Executive Committee without stating a reason. Eleven of the fourteen members of the Commission are appointed by the Government, and politicians are eligible provided they resign seats in Parliament. The three employee representatives on the Commission have retarded the reduction of personnel. The Executive Committee may not release an employee without first obtaining the approval of the employee representatives on the Commission. A troublesome question has been whether or not the old personnel and the pensioners and widows of former employees must be taken over by the new concern.

On January 1, 1924, the southern portion of the Austrian railway system was taken over, which had the effect of simplifying the traffic between the former federal lines and the Southern Railway. It was also possible to amalgamate the rolling stock of the two companies.

The management has sought to regulate wages, to introduce the "piece" work system and the general bonus. In 1925 passenger fares were increased to the prewar basis and freight rates were about twelve per cent higher than they were before the War. The management has directed attention to the reduction of the consumption of coal, has reintroduced a bonus to the engine staff for saving coal, has more strictly supervised the quality of coal furnished, and has brought about the cancellation of some unfavorable coal contracts. There is much interest in electrification. Potential sources of water power are

considerable. Plans have been made for the electrification of about four hundred miles of line. The work of electrification is being confined to the mountainous area in the western part of the country. Funds for this purpose have been advanced in part by the federal treasury, but for most part have been supplied through a loan to Austria by the International League of Nations.

There has been great improvement in the financial situation of the Austrian railroads, and service is much better than before 1923.

RAILROADS OF AUSTRIA

For the year Ending December 31, 1925

Item	State System
Average miles operated	3,620
Employees and equipment:	
Number of employees	87,710
Number of locomotives	2,698
Number of passenger cars	8,145
Number of freight cars	33,300
Services:	
Passengers carried—all classes	127,194,455
Passengers carried—first class	164,027
Tons of freight carried	25,282,611
Train miles	30,458,459
Locomotive miles	46,863,920
Results of operation:	
Operating revenues	$75,200,000
Operating expenses	71,760,000
Net operating revenue	3,440,000
Operating ratio—per cent	95.43

Sources: Bulletin de l'Union Internationale des Chemins de Fer, August, 1926.
Commerce Reports, U. S. Department of Commerce.

HUNGARY

Alongside of Austria, Hungary built up her railroads under a system of state guarantees of interest. After a time the failure of the lines had much to do in bringing about nationalization of Hungarian railroads. By 1907,

the State owned and operated about five thousand miles and worked another five thousand miles which were privately owned, leaving only about two thousand miles under the operation of private corporations.

Railroads of Southeastern Europe

The Hungarian railroads in 1923 and in 1924 reported a deficit. This was in part explained by the abnormally large number of persons on the pay roll and pension lists. Such payments consumed 66 per cent of the receipts of the lines, which have been further reduced by the lessened fares to an exorbitant number of state employees. Wages, pensions, and salaries consumed only about 33 per cent of the receipts of the privately managed Danube-Save-Adriatic line, which railroad showed substantial net earnings for 1923. In 1924 the railroads were reorgan-

ized with a separate administration under the Ministry of the Interior.

Prior to the War the exchange of merchandise between Western and Eastern Europe was carried on chiefly by rail over the network of the Hungarian State railroads—considered an important link in the chain of international lines of communication—with a standard tariff and customs regulations tending to facilitate the movement of goods. During the Communist revolution in 1919, a considerable amount of damage was done to the rolling stock of the railroads by neglect and wanton destruction It is reported that the military authorities after the downfall of the Soviet Government further increased the inefficiency of management and decreased the former official guarantees for security in traffic. The extent to which international trade suffered is noticeable also through the detachment of important sections of railroads in consequence of the division of territory stipulated by the Treaty of Trianon. Railway stations on the frontier were before the war well equipped with freight yards, customs facilities, warehouses, water supply, coal bunkers, lodgings for employees changing duty, and machine shops. The establishment of a new frontier cut off these well-equipped stations and left the Hungarian lines terminating in the open country at the frontier without facilities for handling international or local traffic. Practically all the new frontier stations have poorer equipment than the old ones, being for the most part in small and unimportant towns.

The Government in 1921 reported that there were over six hundred officials and over five thousand men attached to the railroads in excess of those needed to operate the lines. Fourteen thousand five hundred railway employees were deported by the end of 1921 from territories for-

merly a part of Hungary, but after the War incorporated in Czechoslovakia, Roumania, and Jugoslavia.

Formerly Hungary possessed within her own boundaries the resources essential to the manufacture of railway supplies such as iron ore, coal, forest products, and oil. These must now be purchased in foreign markets.

RAILROADS OF HUNGARY

For the Year Ending June 30, 1925

Item	State System
Average miles operated	4,509
Employees and equipment:	
Number of employees	56,622
Number of locomotives	1,927
Number of passenger cars	2,991
Number of freight cars	34,439
Services:	
Passengers carried—all classes	47,971,103
Passengers carried—first class	247,245
Tons of freight carried	18,714,439
Tons of freight carried one mile	1,332,508,659
Train miles	18,397,864
Locomotive miles	24,034,221
Results of operation:	
Operating revenues	$40,083,026
Operating expenses	38,509,974
Net operating revenue	1,573,052
Operating ratio—per cent	96.07
Charges:	
Passenger revenues	10,575,797
Average receipts per passenger—all classes	0.22
Average receipts per passenger—first class	1.55
Average receipts per passenger mile—all classes	0.871¢
Average receipts per passenger mile—first class	2.207¢
Freight revenue	22,820,603
Average receipts per ton mile	1.713¢

Source: Archiv für Eisenbahnwesen, January and February, 1928.

CZECHOSLOVAKIA

A considerable portion of the railway mileage of Czechoslovakia was constructed under authority of the Austro-Hungarian Empire before the World War. With

the dismemberment of the empire much of the railway mileage went to the succession states. In November, 1924, the Reparation Commission decided that the Czechoslovak Government must pay to the Ferdinand North Railway Company annuities amounting each year to 19,119,000 Czechoslovak crowns until December 31, 1940, and that annuities accumulated and unpaid since 1919 to the amount of 41,284,000 Czechoslovak crowns should be paid in eleven semiannual installments. Further, the Conference for Allocation of Prewar Debts held in Prague in October, 1925, determined the annuities to be paid by the Czechoslovak Government to the former Austrian State Railway Company as 3,493,000 French francs per annum until December 31, 1965. The total indebtedness as shown in the budget of the Czechoslovak State Railways as of December 31, 1926, amounts to 6,131,074,000 Czechoslovak crowns.

The general condition of equipment is considered fairly satisfactory, though rolling stock is conceded to be not quite up to the standard of Western European countries. There is a shortage in some types of equipment.

The Czechoslovak State Railways are managed by the Ministry of Railways in Prague through eight subdivisions called directorates. The government budget for 1927 substantially changed the method of financing the capital investments of the state railroads by undertaking to put the railroads on a commercial basis and eliminating the possibility of contracting loans to cover deficits. During the years 1921-1925 the Government had issued six per cent treasury certificates in the amount of 3,000,000,000 Czechoslovak crowns for railway investment purposes.

The budget law of 1927 provided the following appropriation for railway investments:

	Czechoslovak crowns
Estimated operating surplus of the Czechoslovak State Railways	135,387,000
Contribution of the Government Treasury representing approximately a twenty per cent quota of the Government railway transportation tax	136,000,000
	271,387,000

A striking peculiarity of the operation of the State Railways of Czechoslovakia is the imposition of a federal railway transportation tax, which amounts to twenty per cent of the passenger fares and baggage rates and fifteen per cent of merchandise freight rates. An additional ten per cent is levied on passenger fares, the proceeds going to a pension fund for retired railway employees as far as these employees have been taken over by the Government as a charge. The taxes are collected by the State Railways and turned over to the Government treasury without being included in their operating revenues and expenses. These taxes have the effect of appreciably increasing passenger fares and freight rates, and their collection renders more difficult the working out of reasonable tariffs.

Another source of added expense in 1927 was an increase of 187,000,000 Czechoslovak crowns in the wages and salaries of employees resulting from the new adjustment of salaries of government employees. Moreover, the State Railways are obliged to grant tariff reduction for various purposes such as cheaper fares for workmen, school children, government employees, reduced rates for sugar beets, and the like. All this results in an annual loss in operating revenues estimated at 100,000,000 Czechoslovak crowns. Furthermore, gratis services are rendered by the State Railways to other departments of the Government.

Although the railroads are supposed to be on a com-

mercial basis, political influence is strong and has led to undue enlargement of the personnel.

At present the State Railways of Czechoslovakia do not seem to be able to earn money which might be used in increasing the efficiency of the plant and in paying earnings on a valuation roughly estimated at from twelve to twenty billion Czechoslovak crowns.

RAILROADS OF CZECHOSLOVAKIA

For the Year Ending December 31, 1924

Item	State System
Average miles operated	8,248
Employees and equipment:	
Number of employees	163,058
Number of locomotives	4,434
Number of passenger cars	14,693
Number of freight cars	113,749
Services:	
Passengers carried—all classes	241,037,851
Passengers carried—first class	117,445
Tons of freight carried	68,249,632
Tons of freight carried one mile	5,404,836,123
Train miles	62,822,224
Locomotive miles	97,507,313
Results of operation:	
Operating revenues	$130,063,429
Operating expenses	130,387,972
Net operating revenue	Def. 324,542
Operating ratio—per cent	100.25
Charges:	
Passenger revenues	22,967,559
Average receipts per passenger—all classes	0.10
Average receipts per passenger mile—all classes	0.478¢
Freight revenue	87,928,889
Average receipts per ton mile	1.667¢

Def.—Denotes Deficit.
Source: Archiv für Eisenbahnwesen, November and December, 1927.

ITALY

Before the rise of modern Italy and when Italy was only a geographical expression, various Italian States experimented with railway management of every kind.

When, after 1870, Italy was unified, it became necessary to adopt a national policy with reference to railroads and the Italian Government instituted an inquiry, the exhaustiveness of which has not since been approached.[1] Through force of circumstances the Government had already acquired the ownership of the railroads, but the Commission reported that it was not desirable that the Government should operate them.

The Commission submitted the following conclusions:[2] first, most of the pleas for state management are based upon the idea that the State would perform many services much cheaper than they are performed by private companies. This is a mistake. The tendency is decidedly the other way. Private companies can do for their patrons many things which the State cannot do, but it is doubtful whether the State would be justified in doing anything of the sort which private companies cannot. The State is much more likely to attempt to tax industry than to foster it. And when it attempts to tax industry it is more omnipotent and less responsible than a private corporation. Second, state management is more costly than private management; such, at least, was the conclusion of the Commission in comparing the results of the two systems. The differences which they brought out are quite marked, though it is fairly an open question just how much they prove. Comparing state and private railroads in different countries, they found that the ratio of operating expenses to gross earnings was always greater on state railroads, averaging eleven per cent more in all the countries compared. In other more detailed comparisons, the Commission took carefully into account the various elements which involve cost of handling, but unfortu-

[1] Acworth, "Relation of Railways to the State," p. 6.
[2] Hadley, *op. cit.*, p. 228.

nately they did not take up the question whether the rates charged on the state railroads considered might not be lower than on the private railroads. Third, the political dangers would be very great. Politics would corrupt the railway management and the railway management would corrupt politics.

In 1885 the state roads were leased to three companies: the Mediterranean, the Adriatic, and the Sicilian. Each of these companies was given the monopoly in its territory. Concessions were for sixty years, but could be terminated by either party at the end of every twenty years. From the very outset a condition of things developed which had not been contemplated when the leases were granted and for which the leases made no provision.[3] Constant disputes took place between the Government and its lessees, the three companies. Capital for extensions and improvements was urgently needed, neither party was bound to find it, and agreement for finding it upon terms mutually acceptable was impossible of achievement. In the end the Government was forced to cut the knot and break the lease at the end of the first twenty-year period.

The causes for state ownership in Italy have been summarized by Acworth as follows: [4] 1. The railroads were necessary to cement the new unity of the kingdom; 2. The State had to buy the railroads of Lombardy and Venetia from the Austrians who had built them in order that these provinces might be freed from Austrian domination; 3. The leasing of the state lines to great private companies, the result of an inquiry by a Commission which sat from 1878 to 1881, was not a success since the Government was reluctant to supply funds

[3] Acworth, *op. cit.*, p. 2.

[4] "Historical Sketch of Government Ownership of Railroads in Foreign countries," pp. 13-14.

for necessary betterments and private companies refused to take the risk on leases terminable at the end of twenty, forty, or sixty years. Influenced by these considerations

Railroads of Italy

Parliament in 1905 took over the control of the railroads which it had hitherto leased to three companies and also took over a few private lines considered necessary to the public interest.

We may now turn to some of the results that followed the resumption of state management in 1905. Gross receipts increased over fifty per cent during the first eight years. Instead of the operating ratio falling with an increase in density of traffic and increase in per mile earnings, it rose. In the first year it was 73.4 per cent. Afterward it was 79.5 per cent or more, and from 1911 to 1913 it averaged 84.4 per cent. Operating expenses during the eight years between the resumption of government ownership and the outbreak of the World War increased from $58,000,000 in 1906 to $102,000,000 in 1913, being an increase of more than 78 per cent. The number of staff during this period increased 23 per cent, and the average wages increased 27 per cent, amounting to an additional expenditure in wages of $18,330,000.

After the World War there was some agitation in Italy for denationalization of the roads.[5] Industrial organizations pointed out that private-line management was necessary in order to reduce the large deficit that had accumulated. They also claimed that if the railroads were properly managed they would become a good customer of the industries. Furthermore they held that the Treasury could not continue to meet heavy railway deficits, and that the sale of the railroads to private companies would greatly reduce the national debt.

It was thought that the basis of the program of the new cabinet headed by Mussolini would be the transfer of some of the public utilities from government administration to private industry.[6] This contemplated return to private management of the railroads was due in the main to conditions immediately following the World War, though Italian public opinion has never been definitely

[5] *Railway Age*, January 7, 1922, p. 86.
[6] *Ibid.*, January 6, 1923, p. 62.

committed to the policy of government ownership. In 1924 an Italian writer made a statement to the effect that [7] one of the chief causes of the deficit in the budget of the Italian State since the Armistice has been the critical financial state of the Italian state railways. Revenues continued to decrease and expenses continued to increase. Under these circumstances it was no wonder that the Government was more than willing to eliminate the deficit from the state budget by transferring the railroads to private ownership. However, such transfer involved the settlement of two problems; namely, whether or not any private concern would want them, and if so, how much should be paid for them. The practical impossibility of arriving at the solution for these problems led the Government itself to undertake the reconstruction of the railroads.

After the beginning of 1919 the problem of Italian State railway administration was a financial one. The financial condition of the railroads was most deplorable. The operating ratio had risen from 81 per cent in 1913 up to 137.5 per cent in 1920. The deficit rose from 860,000,000 lire during the fiscal year 1919-1920 to 1,258,000,000 lire during the fiscal year 1922-1923. According to the financial announcement during the fiscal year 1924-1925 the administration expected to show a net profit of 176,000,000 lire.[8] For the fiscal year ending June 30, 1926, the operating ratio was brought to 92.5 per cent.

The cost per mile of line in Italy averaged, in 1913, $158,000. This high cost is in a large measure due to topographical difficulties. Italy is a hilly country requiring many expensive bridges and tunnels. Moreover the construction of Italian roads was with government encour-

[7] F. M. A. Giordano, *Railway Age,* January 5, 1924, p. 106.
[8] A. Giordano, *Railway Age,* January 2, 1926, p. 139.

agement and apparently with not very careful supervision as to expenses. In addition to heavy capitalization, much of which might have been avoided, the Italian roads are handicapped by the fact that the coal they use is imported. Traffic originating in Italy consists chiefly of agricultural products.

Following the War there was a great demoralization of railway employees in Italy. In 1920 some eighty thousand men went on a strike. There were strikes by small groups of employees almost daily. The eight-hour day was instituted and enforced in such a manner that men frequently worked only two or three hours a day. Time spent going to and from work was counted part of the eight hours, and sometimes entire shifts spent the eight hours in waiting to begin work. When the eight hours was up men would leave the trains. The number of employees had increased from 154,000 in 1913 to 235,000 in 1920.

The physical plant was in a sorry state through the excessive wear and tear of the War period, through lack of renewals and repairs, and through use of poor coal, wood, and even peat.

When the Fascisti Government came into power at the end of October, 1922, they pledged themselves to balance the state budget and as a means to that end to put the railroads on a paying basis. They had the idea of ultimately handing the railroads over to private enterprise. Dr. Edoardo Torre was appointed special commissioner for the task. Dr. Torre was given as much power as if he had been unanimously supported by a board of directors of a private corporation. The new management administered the eight-hour law so as to get eight hours of time on the job. Between November, 1922, and the end of 1923 the staff was reduced from 226,532 to 180,000. There was a fifty per cent reduction in the number of men absent on

sick pay. A bonus for economy in the use of fuel was again introduced, with the result that at the end of the first six months 280,000 tons of coal had been saved. The sums paid for compensation for damage to goods handled amounted to 1.2 per cent of the freight revenues in 1913; it was 7.3 per cent of the freight revenues in 1921-22; and had fallen to one-half of one per cent in 1924-25. Rates were raised after about a year. Wages were increased. The management of Italian railroads since the War has been marked both by absurd inefficiency and efficiency in response to the policies of the Government. Under a dictator a period of efficiency was inaugurated. That is no argument for absolutism or irresponsible autocracy in government. It merely indicates that good results may be expected from railway management when it is unhampered by political interferences; and usually such freedom from political meddling is most evident under private management.

The railroads of Italy are built ahead of the economic demand for railway transportation. The State has built lines which, though they may contribute to the national prosperity and public convenience, have no chance of paying their way. Political pressure has resulted in compelling the state management to buy railway equipment and supplies in Italy even though the prices are higher and although the industries are already protected by a high tariff. Furthermore, considerable tonnage of merchandise is conveyed by railroads at unremunerative rates. This is particularly true in regard to farm produce and flowers consigned to destinations in foreign countries beyond the frontier. To a greater extent than in any other country in Western Europe, the railroads in Italy are called upon to carry an unusually large number of passengers free or at greatly reduced fares.

Private lines, with few and relatively inconsequential exceptions, have subventions from the State and quite often from towns and provinces in addition. The subventions average one thousand lire per kilometer. In concessions the State usually reserves to itself the right to buy out conceded lines, at the end of a stated time, by paying an annuity equal to one-third of the net profits based on the average of the three or five best years during the last five or seven years which immediately precede the intimation. The State intervenes in private management by requiring its approval for all rolling stock circulating on the lines, by fixing maximum rates, and by prescribing by-laws for the staffs. Nearly all of the private lines in Italy have been operating at a loss since the War.

The State exercises control over motor-bus service on the highways. This control is accompanied by subventions. Motor-car services are also subsidized by the post office. Subsidies are granted only to such motor-bus services as may be regarded as of help to the railroads, and concessions as a rule are withheld from services which might compete with existing railroads.

Railroads certainly have cemented the political unity of Italy and were of invaluable service to the Government during the World War. Sir William Acworth [9] concluded from his study of the experiences of Italy and other countries that it is impossible to obtain satisfactory results on government railroads in a democratic state unless the management is cut loose from direct political control. With the possible exception of Switzerland no democratic country has succeeded in maintaining a permanent severance. The railroads belong to the people. Parliament

[9] "Historical Sketch of Government Ownership of Railroads in Foreign Countries," pp. 62-63.

RAILROADS OF ITALY

For the Year Ending June 30, 1926

Item	State System
Average miles operated	9,793
Employees and equipment:	
Number of employees	171,937
Number of locomotives	6,956
Number of passenger cars	13,464
Number of freight cars	153,409
Services:	
Passengers carried—all classes	113,570,000
Passengers carried—first class	2,750,000
Tons of freight carried	64,601,980
Tons of freight carried one mile	8,698,283,344
Train miles	85,065,546
Locomotive miles	99,229,074
Results of operation:	
Operating revenues [a]	{ $978,011,867 { 199,326,926
Operating expenses [a]	{ 905,033,742 { 184,453,379
Net operating revenue [a]	{ 72,978,125 { 14,873,547
Operating ratio—per cent	92.54
Charges:	
Passenger revenues [a]	{ 316,346,300 { 64,473,999
Freight revenue [a]	{ 609,593,588 { 124,240,227

[a] Computed at both normal and average rate of exchange. The upper and larger figure is at the normal rate of 19.3¢ per lira, while the lower and smaller figure is at the rate of 3.9335¢ per lira, which was the average rate of exchange prevailing during the fiscal year ended June 30, 1926.

Source: Amministrazione delle Ferrovie dello Stato Relazione per l'Anno finanziario, 1925-1926.

represents the people. Parliament should run the railroads. Yet parliamentary interference has meant running the railroads not for the benefit of the people at large, but to satisfy local and sectional and even personal interests. Some day, perhaps, having learned wisdom by experience, a Parliament and a people may recognize that management for the people is not necessarily management by the people, and that there are other branches of government

besides the judicial branch unsuited for popular interference, and may establish a permanent state railway organization entirely independent of parliamentary control, but controlled like any private company to earn a dividend for its stockholders, the people. And then a main objection to government railroads in a democratic state will have lost its force. But hitherto no Parliament and no people have recognized this fact.

CHAPTER V

EASTERN EUROPE AND WESTERN ASIA

ROUMANIA

The latest available reports show that the Government of Roumania owns 4203 miles of normal-gauge line of which 127 miles is double track. In 1923 the Government also owned 215 miles of railroad in Bessarabia. The State owns 144 miles of narrow-gauge line. Private companies own and operate 2027 miles of normal-gauge railroad and 670 miles of narrow-gauge.

The first railroad in Roumania was built by two British engineers and was opened to traffic in November, 1869. This was a short line connecting the capital with Giurgin. Within ten years this line had been extended until it included 895 miles. At the time Roumania declared war on Germany in August, 1916, there were 2230 miles of railroad. Following the War the provinces of Bessarabia, Bukovina, and Transylvania were added to the kingdom of Roumania and the total mileage of the country reached 7052 miles by 1926, of which 640 miles were in Bessarabia, 3384 in Transylvania, and 405 miles in Bukovina.[1]

The network of railroads which existed in the Kingdom of Roumania in prewar days was the result of linking together a number of small roads which had originally been built to serve limited areas. These small lines have now been joined by a central main line in Wallachia and two longitudinal lines in Moldavia, branching off in the

[1] See map showing railroads of Southeastern Europe

direction of the Black Sea and the River Danube. The principal lines concentrate on Ploesti, a city situated some fifty miles north of Bucharest, the capital.

At the end of the War when the railroads were released from the hands of the invading enemy, the railway management was faced with a great expansion of its system. There were very difficult problems in managing the personnel caused by the employment of a large number of workers of many nationalities, many of whom had no knowledge of the national language. The majority of these foreign workers were unacquainted with the Roumanian methods of railway operation and no little confusion resulted. There were other difficulties of operation added to the fact that the railroads of old Roumania were designed mainly for carrying agricultural products to the ports, while the railroads of the three new provinces had been adapted more to internal transportation. The joining of the various lines into one system was quite a difficult problem. There was, for example, no good connection between Transylvania and the principal points on the lower Danube. Moreover a number of the principal points of the country either were not touched by railroads at all or were on small branch lines. It was desirable that these cities and towns should be connected with a main line in the interest of the unity of Greater Roumania. Several of the existing railroads were not strong enough to carry the heavy traffic tendered them and tracks had to be relaid. Some lines had been damaged or demolished during the War and were useless until reconstructed. Today the railroads in Greater Roumania represent the largest industry in the country. The total number of workers employed by the railway administration is more than 120,000. At times the railway administration is finding considerable difficulty in recruiting the staff,

especially during the harvest season and in the districts around the industrial centers. A tax has been placed on all forms of traffic which amounts to 30 per cent on passenger fares and 20 per cent on freight rates. The proceeds of this supplementary tax are to be divided among the various units of the administration according to the work performed. During the past three or four years there has been a considerable increase in all types of traffic.

If capital were available it is believed that there would be considerable railway development in Roumania. It is pointed out that new railroads are needed to carry traffic between the interior and the Danube and Black Sea ports. According to the reports on economic conditions in Roumania, dated March 30, 1926, the freight service remains inadequate to the demands of constantly increasing traffic. It has been difficult to obtain capital with which to purchase additional rolling stock and to construct necessary sidings and other improvements.

In 1925 an effort was made to detach the railroads from all political influences and to give them a continuity of aim by making their officials permanent. In 1927 the Government decided to bring the railroads again more closely under direct state control and in February, 1927, an Undersecretary of State for Railways was created to whom was transferred the powers formerly vested in the Director General of Railways. It was also provided that two foreign persons may become members of the Board of Administration of the Railways should the necessity arise in connection with obtaining foreign financial assistance. That foreign credit is necessary is admitted both officially and privately. Existing lines and equipment are not sufficient to handle with dispatch the imports and exports and the internal commerce.

RAILROADS OF ROUMANIA

For the Year Ending December 31, 1925

Item	State System
Average miles operated	7,052
Employees and equipment:	
Number of employees	114,764
Number of locomotives	4,294
Number of passenger cars	3,214
Number of freight cars	34,542
Services:	
Passengers carried—all classes	50,726,971
Passengers carried—first class	657,641
Tons of freight carried	18,329,804
Tons of freight carried one mile	2,184,998,575
Train miles	33,017,505
Locomotive miles	46,053,623
Results of operation:	
Operating revenues [a]	{$1,584,825,726 { 39,678,124
Operating expenses [a]	{ 1,566,651,454 { 39,223,108
Net operating revenue [a]	{ 18,174,272 { 455,016
Operating ratio—per cent	98.85
Charges:	
Passenger revenues [a]	{ 485,096,007 { 12,144,994
Average receipts per passenger—all classes [a]	{9.72 {0.24
Average receipts per passenger mile—all classes [a]	{24.292¢ { 0.608¢
Freight revenue [a]	{ 1,023,828,895 { 25,632,856
Average receipts per ton mile [a]	{47.620¢ { 1.192¢

[a] Computed at both normal and average rate of exchange. The upper and larger figure is at the normal rate of 19.3¢ per leu, while the lower and smaller figure is at the rate of 0.4832¢ per leu, which was the average rate of exchange prevailing during 1925.

Source: Archiv für Eisenbahnwesen.

POLAND

Before the World War the railroads of Poland in the main were comprised in the railway systems of Russia, Austria, and Prussia. The interests of these three coun-

tries in railway development in Polish territory differed greatly. In the former Prussian district the density of railroads is about the same as in Western Europe. In

Railroads of Poland

the former Austrian section it is only half as great, and in the former Russian section only about one-third as great. Since the Polish Government has taken over its

roads there is no little discontent in the former Russian district. One of the chief tasks of the Polish Ministry is to complete and unify this heterogeneous system and to adapt it to the service of the country.[1]

Poland in respect to total mileage occupies the sixth place in Europe after Russia, Germany, France, Great Britain, and Italy. On July 1, 1925, the railway system of Poland consisted of 10,461 miles of standard gauge. All standard-gauge lines and 1110 miles of the narrow-gauge lines are operated by the Government. Since 1922, 547 miles of standard-gauge lines have been constructed. The rolling stock which Russia, Austria, and Germany left to Poland was obviously not the best which those countries possessed. It was for the most part in very bad order. In 1919 Poland did not have a locomotive factory within its boundaries and the car factories and repair shops had been destroyed during the War. The Polish Government at first was forced to obtain necessary rolling stock from abroad and to make contracts with foreign concerns for the repair of part of its railway equipment. At present there are three locomotive factories in Poland and six car factories. The old repair shops for the most part have been reconstructed and new ones have been added. Great progress has been made in repairing war damages. Forty-five per cent of the 10,000 yards of smaller bridges have been reconstructed and 40 per cent of the 25,000 yards of bridges of larger span. Four hundred and thirty-five out of a total of five hundred and twenty destroyed station buildings have been rebuilt. Reconstruction has brought back into existence 79 per cent of the destroyed water works, 62 per cent of the magazines, 63 per cent of the locomotive sheds, and 28 per cent of the administration buildings.

[1] A. Wasiutynski, *Railway Age*, January 2, 1926, p. 141.

RAILROADS OF POLAND

For the Year Ending December 31, 1926

Item	State System
Average miles operated	11,914
Employes and equipment:	
Number of employees	195,626
Number of locomotives	5,476
Number of passenger cars	11,962
Number of freight cars	142,494
Services:	
Passengers carried—all classes	147,897,258
Passengers carried—first class	59,055
Tons of freight carried	68,376,987
Tons of freight carried one mile	10,291,847,106
Train miles	64,542,142
Locomotive miles	85,338,150
Results of operation:	
Operating revenues [a]	{$215,844,843 { 125,028,964
Operating expenses [a]	{ 180,927,728 { 104,803,089
Net operating revenue [a]	{ 34,917,115 { 20,225,875
Operating ratio—per cent	83.82
Charges:	
Passenger revenues [a]	{ 52,156,561 { 30,211,890
Average receipts per passenger—all classes [a]	{$0.35 {0.20
Average receipts per passenger mile—all classes [a]	{1.394¢ {0.807¢
Freight revenue [a]	{ 134,297,751 { 77,792,494
Average receipts per ton mile [a]	{1.305¢ {0.756¢

[a] The upper and larger figure is at the normal rate of 19.3¢ per zloty, while the lower and smaller figure is at the rate of 11.1796¢ per zloty, which was the average rate of exchange prevailing during the year 1926.

Source: Rocznik Statystyczny Polskich Kolei Panstwowych za Rok Eksploatacyjny 1926.

Railroads in Poland are replenishing and modernizing their rolling stock. The initial efforts in the attainment of this end involving both locomotives and freight cars were made by American manufacturers.[2] During 1926 there were purchased 842 locomotives, 683 passenger cars,

[2] W. de Wankowicz, *Railway Age*, January 1, 1927, p. 161.

and 1100 freight cars. Plans were made for purchase in 1927 of 100 locomotives, 170 passenger cars, and 2700 freight cars. At the end of 1926 the Polish railroads owned 5500 locomotives, 12,000 passenger cars, and 143,000 freight cars. Traffic in Poland is reported as growing, the rise in freight traffic being constant and more nearly approximating what it was before the War. The attainment and possible surpassing of the prewar volume is not altogether dependent upon business conditions in Poland. It depends in a considerable degree on future transportation relations with foreign countries, particularly with Russia. Polish railroads have effected several transportation agreements with foreign countries and have arranged to put into execution international tariffs in their communication with adjacent as well as more remote railroads. The financial results of the operation of the railroads have been favorable since 1924. The following tables are illuminating:

	Area in 1000 of sq. mi.	*Population according to the census of 1921 in millions*	*Railway mileage, September, 1925*	*Miles per 100 sq. mi. of area*	*Miles per 10,000 inhabitants*
Former Russian Poland.....	101.2	15.5	4591	4.5	2.9
Former Austrian Poland.....	31.0	7.7	2807	9.0	3.6
Former Prussian Poland.....	17.8	3.9	3063	17.2	7.8
	150.0	27.1	10461	7.0 ave.	3.9 ave.

	1921	*1922*	*1923*	*1924*
Mileage operated miles..	9,541	9,914	10,304	10,368
Number of locomotives..	3,763	4,374	5,030	5,079
Number of locomotives per 10 miles.....	3.9	4.4	4.9	4.9
Number of locomotives in repair	1,594	1,669	1,675	1,493
In repair, per cent.....	42.4	38.2	33.3	29.4
Passenger cars	8,680	9,454	11,710	11,661
Passenger cars per 10 mi..	9.1	9.5	11.4	11.3

	1921	*1922*	*1923*	*1924*
Passenger cars in repair..	2,382	2,793	2,520	2,691
Passenger cars in repair, per cent	27.4	29.5	21.5	23.1
Freight cars	84,044	97,145	118,471	126,469
Freight cars per 10 mi....	88.1	98	115	122
Freight cars in repair....	15,278	13,268	15,036	16,180
Freight cars in repair, per cent	18.2	13.7	12.7	12.7

BULGARIA

With the exception of eighteen miles of line owned by the timber companies, all of the railroads of Bulgaria are owned by the Government and are operated as the Bulgarian State Railways. In 1926 there were in operation 1426 miles of broad-gauge road, and 216 miles of gauge less than four feet. The railroads of Bulgaria suffered considerably during the World War. Rebuilding of certain lines has been carried forward rather slowly. During 1926 some work was done toward reconstructing the Sofia-Rustchuk line. Much work is necessary before the State Railways of Bulgaria are put in good condition. It seems to be difficult to obtain capital for the necessary reconstruction and improvements.[1]

RAILROADS OF BULGARIA

For the Year Ending March 31, 1925

Item	State System
Average miles operated.....	1,427
Employees and equipment:	
Number of employees	15,890
Number of locomotives	406
Number of passenger cars	621
Number of freight cars	6,331
Services:	
Passengers carried—all classes.....	8,982,093
Passengers carried—first class	18,940
Tons of freight carried	3,602,369
Tons of freight carried one mile	375,470,470
Train miles	4,663,493
Locomotive miles	5,764,339

[1] For railroads of Bulgaria, see map of Southeastern Europe, above.

RAILROADS OF BULGARIA—(*Continued*)

Item	State System
Results of operation:	
Operating revenues [a]	{$173,781,253 { 6,492,035
Operating expenses [a]	{ 112,000,771 { 4,184,070
Net operating revenue [a]	{ 61,780,482 { 2,307,965
Operating ratio—per cent	64.45
Charges:	
Passenger revenues [a]	{ 65,990,912 { 2,465,256
Average receipts per passenger—all classes [a]	{$7.35 {0.27
Average receipts per passenger mile—all classes [a]	{18.611¢ { 0.695¢
Freight revenue [a]	{ 101,561,474 { 3,794,084
Average receipts per ton mile [a]	{27.050¢ { 1.011¢

[a] Computed at both normal and average rate of exchange. The upper and larger figure is at the normal rate of 19.3¢ per lev, while the lower and smaller figure is at the rate of 0.721¢ per lev, which was the average rate of exchange prevailing during the fiscal year ending March 31, 1925.

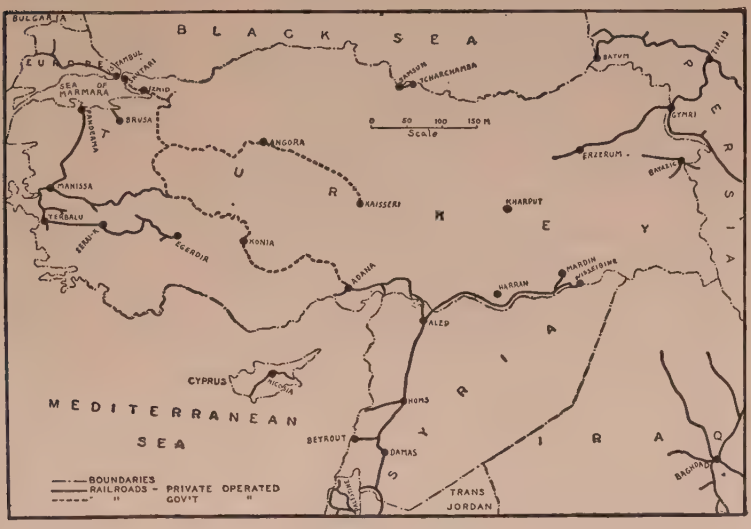
Source: Archiv für Eisenbahnwesen, September and October, 1927.

TURKEY [1]

There are six main railway systems in Turkey—the Anatolian, the Bagdad, the Smyrna-Cassabe, the Smyrna-Aidin, the Constantinople-Adrianople, and the Cilician and North Syrian. The Anatolian and Bagdad systems are continuations one of the other. The Cilician, otherwise

[1] It has been next to impossible to obtain adequate information concerning the railroads in Southeastern Europe. A commercial attaché in Turkey, referring to the data which, in response to a questionnaire, he had sent to the Department of Commerce, and which are used as a basis for this presentation, made this comment: "A special effort has been made to obtain the information desired for this report, but business being slow moving and statistics being rudimentary in the Near East it has taken a long time to do so. Even now the figures on hand cannot be vouched for. Furnished in each case by competent authorities they are assumed to be as reliable as possible, but the word 'reliable' applied to statistics here is always unsafe."

known as the Mersina-Tarsus-Adana, is under French control along with some other lines in Cilicia and North Syria. In addition to these six main railway systems there



Railroads of Turkey

are three other systems in Turkey worthy of mention. They are the Angora-Kaisseri, which was opened to traffic early in June, 1927, the Black Sea system, which is a short line from Samsun to Tcharchamba, and what was once the Russian military system in the Eastern provinces leading up to the Soviet frontier. There does not appear to be regular service on these three short lines with the exception of the Samsun-Tcharchamba line.

The Anatolian Railroad properly speaking extends as far as Konia in Asia Minor and from there on it becomes the Bagdad system. Both the Anatolian and Bagdad are owned by foreign capitalists largely French and German, though the Turkish Government is making efforts to buy

these roads. The Anatolian Railroad is controlled by the Oriental Railroad Bank in Zurich, Switzerland, which, in turn, is more or less tied up with the Deutsche Bank, in Berlin, Germany. It seems that both the Anatolian and Bagdad railroads as far as Adana in Cilicia are exploited by Turkish Government officials without let or hindrance with a minimum of regard for the wishes of the stockholders. From Adana to Aleppo, the lines are exploited by French and French-Syrian officials for the account of the Turkish Government. From the frontier to Nisseibine, the Bagdad road occupies a very curious position. It constitutes the frontier between Turkey and Syria. Its passengers when traveling are reputed to be in Syrian territory, but when alighting on station platforms, in Turkish territory. The railroads of Turkey appear to have received considerable subsidies from the Ottoman Government.

The Constantinople-Adrianople Railroad, also known as the Oriental Railways, connects Constantinople with Western Europe. The main line of the Oriental Railways was completed in 1888. Under the present boundaries of Turkey the main line runs from Constantinople to a crossing of the Maritza River, thence into Greek territory. It continues in Greek territory to within a few kilometers southwest of Adrianople, when it reënters Turkish territory for a few kilometers. After leaving Adrianople it once more enters Greek territory, continuing to Sofia and to Western Europe. It is reported that the total length of the Oriental Railway lines in Turkish territory is 336 kilometers. The passenger service between Constantinople and Western Europe is considerably more important than the freight service.

In Syria there are two railway systems with a total of 547 miles.

RUSSIA

Before the middle of the nineteenth century there was not much foreign trade and commerce to be provided for in Russia. There was little seacoast and but few seaports. The rivers and canals provided excellent means of transportation. Moreover the intense cold in parts of Russia interrupted communication for months at a time and the lofty mountains offered further and great obstacles. The great distances to be traversed made the cost of railway construction almost prohibitory.

Before the World War the Government owned and worked two-thirds of the total railway mileage of Russia. There seemed to be a tendency in the direction of private ownership subsidized and closely supervised by the Government. Then came the World War which brought tremendous changes.

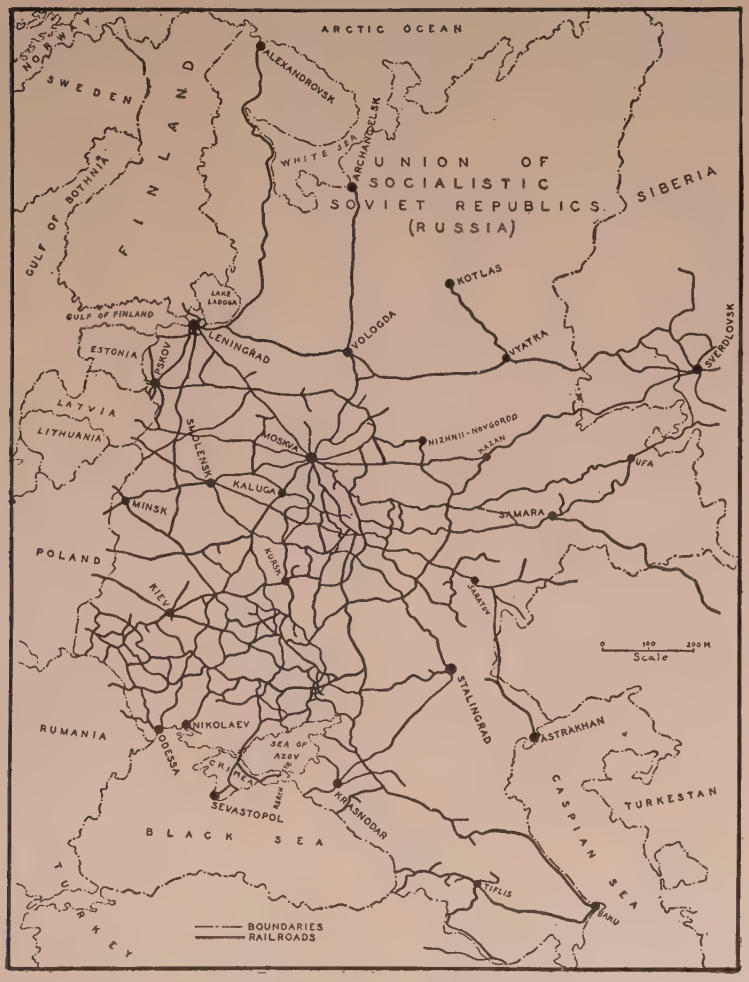
Russia for the reasons already mentioned has always been a rather backward country in regard to transport. In 1913 the total railway mileage was 42,500 miles. With a land area nearly three times that of the United States, the railway mileage was about one-sixth of that in the United States. It was only during the decade immediately before the War that private capital was called into the transportation business. At the opening of the War it is estimated by the Soviet Government that about ten per cent of the total railway mileage was under private operation in partnership with the Government.[1] During the War about 13,000 miles of track in Russia were completely destroyed and something like 8000 railway bridges. By the end of 1919 there were hardly 4000 locomotives in good order throughout the entire country with its more than 8,000,000 square miles. A considerable

[1] Harold Kellock, *Railway Age*, January 1, 1927, p. 163.

portion of the railway mileage with equipment had passed to the border countries which were severed from the territory of the former Russian Empire at the close of the War. The Soviet Government recognized the importance of building up the transport system. The state gold reserve was drawn upon heavily to purchase equipment abroad and Djerzinsky, at the head of the Commissariat for Transport, was placed in command of the transport system. The mileage was increased until it is now approximately 46,000 miles; that is, greater than the prewar mileage, despite the losses to border countries where the Government had built strategic railroads for the anticipated war with Germany.[2]

The volume of traffic is about eighty per cent of the prewar, the population being about seventy-seven per cent of that in 1913. The number of locomotives in good order in August, 1926, was 10,800 as compared with 16,850 in 1913.[2] The average daily freight-car loadings in September, 1926, were 28,500 as compared with an average of 33,000 in 1913.[2] According to the statistical directory of the Russian Information Bureau, Russian railway systems showed a net profit from operation of $5,650,000 for the fiscal year 1924-1925, the first profitable year since the War. Total revenues for 1925-1926 were said to be $659,000,000 as compared with $478,000,000 for the previous year.[2] It is claimed that the increase in industrial production for that year was forty-one per cent and the increase in agricultural production was forty per cent, the year 1924 having yielded a poor harvest. Some 1250 miles are under construction in southern Siberia from Orsk to Barnaul. Other lines are contemplated in order to reach undeveloped districts, particularly in Siberia where rich natural resources have

[2] Harold Kellock, *Railway Age*, January 1, 1927, p. 163.



Railroads of Russia

been located. The most important of these projected new lines is to run from a point in southwestern Siberia into the cotton belt of Central Asia a distance of 882 miles. It is expected that this line will bring Siberian grain and timber to the Turkestan cotton districts where both are scarce and that it will cross some rich undeveloped coal districts.

The Russian railroads now maintain two classes of passenger service known as hard seat and soft seat; the price in a soft-seated car being double that in a hard-seated car.

The railroads are operated directly by the Government under the Commissariat for Transport. The transport system and the posts and telegraph and telephone systems are the only industrial enterprises operated directly by a department of the Government. Such public services were operated by the Government before the revolution. The Soviet Government claims that before 1914 the Tsarist Government was engrossed in perfecting a system of strategic military railroads in the western portion of Russia. To quote, "Germany bristling with armament and fulminating of 'a place in the sun,' crowded the western boundary, and Tsarist Russia, linked to France with golden chains, expected to secure the Bosphorus as a result of the anticipated world conflict. Both Kaiser and Tsar faded out as a result of the titanic struggle and to-day the Soviet Union is extending its railway system according to a plan designed primarily to develop the vast natural resources of the country. The government extensions are being supplemented here and there by lines built by some of the larger concessionaires, though as yet this process has not become of great significance. In general it may be said that the railway system of the Soviet Union has now made up

for the widespread destruction caused by the World War and the prolonged internal conflicts. An era of railway progress along carefully planned economic lines is under way. In the matter of railway development the country is about a half-century behind the United States. Its tremendous natural resources predicate a notable development of transportation during the next few decades. For this, lack of basic capital within the country is the greatest present handicap." [3]

RAILROADS OF RUSSIA

For the Year Ending September 30, 1925

Item	State System
Average miles operated	45,893
Employees and equipment:	
Number of employees	719,991
Number of locomotives	20,143
Number of passenger cars	29,470
Number of freight cars	445,403
Services:	
Passengers carried—all classes	211,825,000
Tons of freight carried	91,992,000
Tons of freight carried one mile	32,492,143,000
Train miles	133,219,000
Locomotive miles	186,950,000

Source: Archiv für Eisenbahnwesen, July and August, 1927.

It appears that the Soviet Government in Russia, like the Mussolini Government in Italy, is autocratic. Being autocratic it deals rather summarily with many undertakings. The attitude toward transportation is very different from what would be expected in a representative form of government where the interests of groups could, through political channels, be brought to bear upon the management of government roads. An autocracy recognizing how to get the best transportation service, summarily sets up an organization or management as independent as if directed by the shareholders

[3] Harold Kellock, *Railway Age*, January 1, 1927, p. 163.

of a private corporation. However, there is this difference: in a representative government it is understood that a private corporation functions independently with the approval of the people and the sanction of the law; whereas in an autocracy if the management of government-operated railroads be independent, it is due to a *fiat* of the Government, which may be contrary to the theories professed by the autocracy.

CHAPTER VI

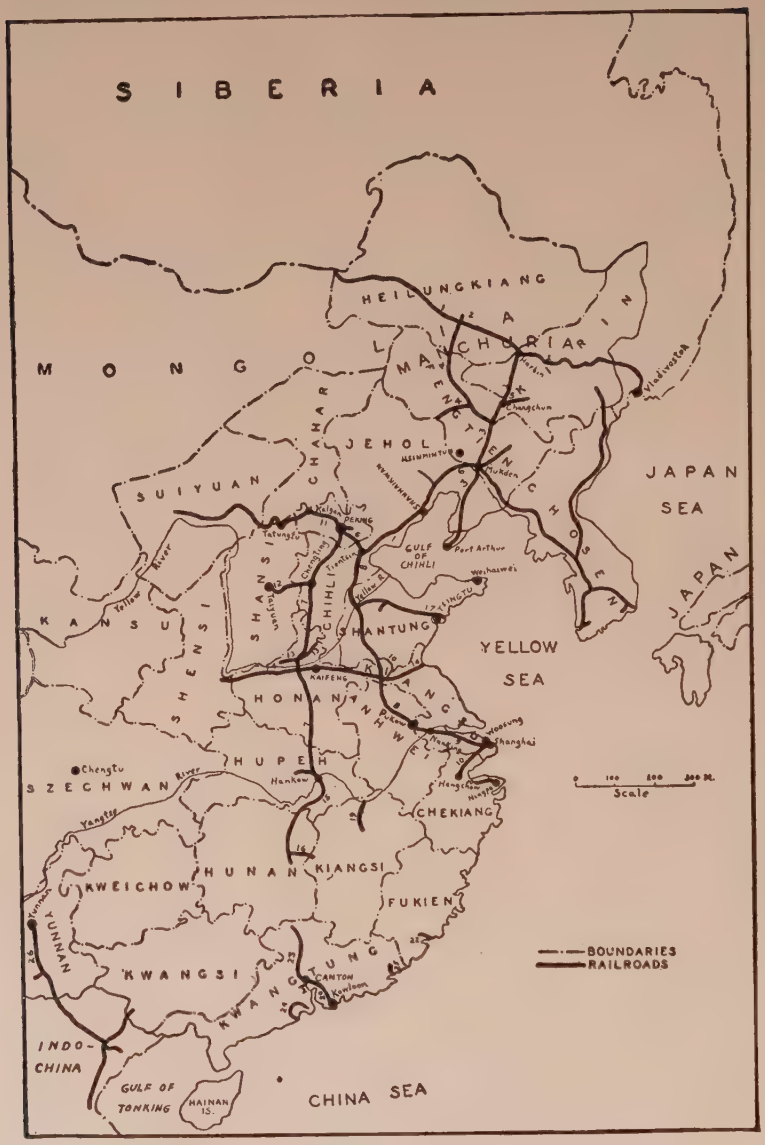
EASTERN ASIA

CHINA

The railroads in China and its dependencies will not exceed 7500 miles. In the main they are confined to the coastal plain and Manchuria, although there are a number of small lines scattered throughout the country.

In Manchuria the railroads do not constitute a single system, although they are for the most part continuous. There are three systems: the Chinese Eastern, the South Manchuria, and the Government Railways. The two lines owned by the Government are operated as branch lines by the South Manchuria. Though there is a junction of the South Manchuria with the Chinese Eastern at Changchun, a break in traffic is necessary because the South Manchuria has the five-foot gauge of the Russian State Railways, while the Chinese Eastern has the four-foot-eight-and-a-half-inch gauge which is standard in China. At Mukden the South Manchuria joins the Chinese Government Railways, but a break in traffic has been necessary because the automatic coupler on the Chinese Railways has been six inches higher.

The lines of the coastal plain form a system of more than 3500 miles. The continuity of the system is broken by the Yangtze River over which there are neither bridges nor car ferries. Only about 650 miles of the system are south of the Yangtze River. North of the river short industrial lines usually connect with the trunk lines. South of the river such lines lead to ports rather than to railroads. Three short lines have been built out from



Railroads of China

Lines[1]	Mileage	Management	Nationality of Construction Funds	Operating Ratio %	Remarks
1. Chinese Eastern	1,078	Concessioned	Russian	82.5	
2. Tsitsihar	18	(No data available)			
3. South Manchuria	681	Concessioned	Russian	39	Ceded to Japan by Russia in 1905
4. Ssu-Tao	266	Government	Japanese	70	Operated by South Manchuria
5. Kirin-Changchun		Government	Chinese	64	South Manchuria R'y now operates this line
6. Peking-Mukden	617	Government	Chinese & British	63	British capital used for "outside wall" extension only
7. Peking-Hankow	822	Government	Belgian	43	Original Belgian capital refunded by means of an Anglo-French loan, 1908
8. Tientsin-Pukow	691	Government	British & German	60	German bonds acquired by China in settlement after World War
9. Shanghai-Nanking	204	Government	British	60	
10. Shanghai-Hangchow-Ningpo	180	Government	British	88	Short sections begun with Chinese capital
11. Peking-Suiyuan	461	Government	Chinese	69	
12. Cheng-Tai	152	Government	French & Belgian	44	
13. Taokow-Chinghwa	95	Government	British	45	French participation
14. Ling-Hai (including Kaifeng-Honan)	446	Government	Belgian & Dutch	43	
15. Hupeh-Hunan	264	Government	Four Nation Group	86	Operated as the "British section"
16. Chuchow-Pinghsiang	56	Government	Chinese	136	
17. Shantung (Kiao-Tsi)	283	Government	German	52	Seized by Japan in 1915 and purchased by China in 1922
18. Chung Hsin Mining Co.	32	(No data available)			
Mentowkow-Chaitang	38				
Nanking City	5				
Poshan Light Ry.	14				
19. Kiukiang-Nanchang	79	Other lines	Chinese	112	Debt held by Japanese interests
Tayeh Mining Ry.	15				
Shantung Wen	42				
Lin-Kiang Yangho	14				
Yu Ning	23				
Ching Shih	18				
Tsehsien Ya Lu	19				
Lung Yen Iron	13				
20. Canton-Kowloon	90	Government	British	67	
British section	29	Concessioned		79	Property of Hongkong Government
21. Canton-Samshui	30	Government	American	51	Bought out by China in 1904
22. Changchow-Amoy	18	Government	Chinese	112	
23. Kwangtung	141	Other lines	Chinese	(Not reported)	Property of the Province of Kwangtung
24. Sunning	93	Other line	Chinese	90	
25. Chaochowfu-Swatow	26	(No data available)			
26. Yunnan	288	Concessioned	French	75	Operated as integral part of French Indo-China R'y.

[1] Numbers refer to railway map and serve as a guide to location.

Canton. They have no physical connection with each other and taken together do not equal 300 miles.

The first effort at railway building in China was at Shanghai, where a British firm obtained a charter after ten years of effort and opened a short line in 1876. The track was of thirty-inch gauge and the locomotive weighed less than one ton. A dispute arose as to the right to use a locomotive. A little later a Chinese, apparently bent on suicide, was run over by a train. This incident was used so effectively that the British operators were forced to sell out to the local authorities, who tore up the track and shipped it with the rolling stock to Formosa, where it was dumped on the beach. It was some years before there was any more railway construction in the vicinity of Shanghai. In 1881 British engineers opened a standard-gauge line for six miles from the coal mines at Tangshan to Pehtang. The charter contemplated that motive power would be furnished by men or animals. In 1889 this road was extended to Tientsin, and in 1891 the Imperial Government ordered it built on to Shanhaikwan as a military expedient. In 1894 the Government decided to take over the railroad, and extend it in both directions. In that year the road was built to Fengtai, and surveys were carried on in the direction of Vladivostok. Construction had reached some forty miles north of the Great Wall when war broke out with Japan.

After the war in which Japan defeated China, the idea became current that the Chinese Empire was about to fall apart, and there was quite a struggle among different nations for possessions along the Chinese border and for what came to be known as "spheres of influence." In swift succession came agreements between China and Russian, French, German, and British interests, all closely backed by their home Governments. The first

agreement was that a private company created by the Russian Government should build the Chinese Eastern Railroad across Northern Manchuria. Next the Yunnan Railway was to be built from Yunnan to a connection with the French railroads in Indo-China. The German Government obtained the right to build a railroad northward from the harbor of Port Arthur to a junction with the Chinese Eastern at Harbin. Great Britain secured control of Weihaiwei and obtained the general promise that the construction of railroads in the Yangtze Valley should be confided to British companies. Belgian agents in competition with British and American syndicates and with the support of the Russian and French legations obtained a concession to build a railroad from near Peking to Hankow. Later as a consequence of this contest an American syndicate obtained a concession to build a railroad from Hankow to Canton. British capitalists made a loan to China with which to build from a point north of the Great Wall where construction had ceased to Hsinmintun. Out of a controversy with Russia over this loan it was agreed between Great Britain and Russia that Russia would raise no objections to British projects in the Yangtze Valley.

In the case of the Chinese Eastern, the Yunnan, and the Shantung railways, the entire ownership and risk of the enterprise was conveyed without reservation to the foreign concessionaire, who, in all cases, although appearing in the agreement as a private concern, was known to be the direct agent of its home Government.[1] In the case of the Peking-Hankow and the Peking-Mukden, however, ownership was vested in the Chinese Government, which accepted the responsibility of repaying the loans

[1] "China, A Commercial and Industrial Handbook," U. S. Department of Commerce, Government Printing Office, 1926, p. 312.

with interest, and pledged the general revenues of the Government for that purpose. As further security the agreements provided a comprehensive degree of administrative control of the lines by nominees of the loaning syndicate.

Following the suppression of the Boxer uprising, the support which foreign military forces gave to the Manchu throne by recalling the empress dowager from her flight, resulted in a large number of contracts with foreign financial groups for the construction of railroads for the Chinese Government. In 1903 and 1904 agreements were made for the Shanghai-Nanking, the Cheng-Tai, and the Kaifeng-Honan lines. These contracts were modeled after the Peking-Hankow agreement, which placed practically the entire administrative control of these railroads in the hands of foreign agents.

In the meantime what may be termed the "Local Movement" had been developing.[2] For twenty years Chinese youth had been going abroad for education. In foreign universities and from observations of foreign methods they had learned about corporate organization and they were eager to apply their learning. As early as 1898 a number of short lines, such as from Shanghai to Woosung, were begun by the Chinese themselves. The group of contracts entered into by the Government in 1903 gave new impetus to native ambition. The Americans were persuaded to sell their concession to build from Canton to Hankow and the project was parceled out to provincial companies. After 1904 the Imperial Government found itself practically unable further to extend the railway system by means of foreign loans. The last contract to be negotiated by the Empire under the old terms was in 1907 with a British concern to build ninety miles to Canton.

[2] "China, A Commercial and Industrial Handbook," U. S. Department of Commerce, Government Printing Office, 1926, p. 313.

After 1905 native companies were formed to build railroads between Tientsin and the Yangtze River; between Shanghai and Hangchow; between Hankow and Szechwan; and several projects scattered through the various provinces of the Central plain. In 1906 the Central Government began the construction of the Peking-Kalgan line. In 1908 China regained control of the Peking-Hankow line, which had unexpectedly proved to be profitable.

It soon became apparent that the native forces were hardly equal to the responsibilities they had assumed. Charges of corruption were made by stockholders against the officers. Countercharges of failure to meet stock-assessments were made by officers against stockholders. Mismanagement, favoritism, and intrigue for personal ends were common accusations. The Central Government found itself in an embarrassing position. On the supposition that native capital was available, it had denied to foreign contractors the right to build railroads. Native capital showing itself to be incompetent rendered the Central Government diplomatically helpless when foreign interests reappeared to enforce their claims. In 1911 a contract was made with the so-called "four-nation group," consisting of bankers in England, Germany, France, and the United States. This agreement aroused a storm of protest in China, and was represented in the provinces as a partition of South China among the four powers named. This continued until the Manchus abdicated in February, 1912. With the passing of the Manchus, local opposition to building railroads with foreign capital ceased. Within a year the provisional President of the new Republic was advocating the construction of 50,000 miles of trunk lines within the ensuing ten years by means of foreign loans. That same year an agreement was made for the extension of the Kaifeng-Honan line

eastward to the coast and westward to the interior of Kiangsu. The following year still another agreement was made with Franco-Belgian interests to build a north and south trunk line from Tatungfu in Shansi to Chengtu in Szechwan. At about the same time a concession was given a British company to build a road from Pukow west to the Peking-Hankow line. Contracts were made with British and French interests to construct considerable mileage south of the Yangtze River. During 1913 and 1914 contracts were entered into for the construction of between 6000 and 7000 miles of railroad. The foreign contractors were given an administrative control over the railroads about equal to what had been provided in the agreements with the Manchu Government. The outbreak of the World War prevented the fulfillment of these agreements. In 1915 an American company attempted to secure a contract to build a railroad. In 1917 and 1918 the Japanese did obtain several contracts. Later and with the acknowledgment of their home Governments, financial institutions in France, England, Japan, and the United States made an agreement for the joint financing of future railway construction and other large industrial enterprises in China. This combination was known as the "New Consortium."

It was believed that this combination would do away with the "spheres of influence" and would allay Chinese suspicions that foreign countries had selfish motives in encouraging the industrial development of China. The results, however, were quite the opposite of those anticipated. The Chinese, instead of being insured of immunity from foreign aggression, got the notion that its effect would be to subject them absolutely to foreign domination. Their opposition to the consortium was emphatic.

The result of the various disturbances in China and of the conditions incident to the World War has been that under the Republic only about 1000 miles of railroad have been built over against 6000 miles constructed during the last twelve years of the Empire. Under the Republic, however, there has been considerable progress toward welding the railroads of China into a national system. The general accounts of all the railroads subject to the jurisdiction of the Central Government have been reduced to a relatively common standard; through trains run between the principal centers; tickets can be purchased and baggage can be checked from any point to any other point upon any of the contiguous lines; uniform rules for packing and shipping goods have been provided; the metric system of distance and weight has been put into effect upon all lines; and through billing of goods and interchange of rolling stock have been introduced. Arrangements have been worked out for through traffic between the lines of the Chinese Government and the South Manchuria, and Chinese Eastern, the Chosen, and the Imperial Railways of Japan. The standardization of physical equipment has been agreed upon in principle, but the actual working out of the details will require considerable time.

The carrying out of these reforms will no doubt be greatly delayed and the development of China's railway system will be arrested by the civil wars that have broken out and the uncertainty as to the future of the Government.

On the railroads constructed under special concessions, the form of management follows generally the practice in the homeland of the concessionaire, with special features provided to meet special conditions. Both the Chinese Eastern and the South Manchuria transcend the ordinary

functions of a railroad and are a sort of political state in charge of police control along the railroad, directing general civic and educational matters, engaging in extensive mining operations, and generally directing matters of commerce and industry within the territory of the railroad.

The chief difference in organization of the departments of maintenance of way and of equipment between China and America, is that the number of employees is considerably greater in China. The engine crew and the train crew are entirely independent of each other and there is little coöperation between them.

The responsibility for getting trains over the line devolves principally upon station masters.

There are generally three classes of passenger equipment and sometimes four.

Freight traffic moves principally in carload lots and in through trains between large centers. Other freight traffic is hauled in mixed trains upon which passenger traffic predominates.

Pilferage is a very serious matter on Chinese railroads and the Chinese Government Railways accept shipments only at the owner's risk except at special rates, some ten per cent higher than the normal rate. The result is that most shippers send a watchman with their cargo. Each province levies one or more transit taxes; therefore it is necessary for some sort of agent to accompany cargo going long distances. As these taxes are more or less arbitrary and without system, it is profitable for those who are familiar with the situation to make special arrangements with the tax collector at each of these likin [3] stations. Thus the railway risk rate is attractive

[3] Likin, a Chinese provincial tax levied at inland stations on imports or articles in transit.

RAILROADS OF CHINA

For the Year Ending December 31, 1924

Item	Chinese Eastern Railway	State System
Average miles operated	1,162	4,372
Capitalization or cost of construction	.....	$337,226,261
Capitalization or cost of construction per mile	.....	76,973
Employees and equipment:		
Number of employees	16,817	113,091
Number of locomotives	607	1,146
Number of passenger cars	703	1,789
Number of freight cars	9,562	16,831
Services:		
Passengers carried—all classes	2,319,948	41,305,701
Passengers carried—first class	.....	176,199
Tons of freight carried	3,391,395	29,312,130
Tons of freight carried one mile	700,200,810	3,131,224,218
Train miles	2,838,961	18,974,759
Locomotive miles	4,118,040	31,481,581
Results of operation:		
Operating revenues	$18,735,237	$ 62,181,794
Operating expenses	11,265,419	35,352,838
Net operating revenue	7,469,818	26,828,956
Operating ratio—per cent	60.13	56.85
Charges:		
Passenger revenues	3,915,627	20,827,332
Average receipts per passenger—all classes	1.69	0.50
Average receipts per passenger—first class	.....	3.86
Average receipts per passenger mile—all classes	1.666¢	0.988¢
Average receipts per passenger mile—first class	.....	2.939¢
Freight revenue	14,024,499	34,034,475
Average receipts per ton mile	2.000¢	1.080¢

Source: Ministry of Communications, Republic of China, Statistics of Railways for the year ending December 31, 1924.

to only the occasional small shipper over short distances. Yet the presence of a watchman is not full guarantee against pilferage. Closed cars are perhaps more often subject to such depredations than are open cars, unless the former are fitted with steel floors. The poverty of the people of China is so compelling that almost any risk and labor will be undertaken to bore through the floor of a closed car into a possible tin of oil or other liquid. The sharpened end of a hollow bamboo thrust into a sack of grain leaves no evidence of violence, but in the course of half an hour sufficient dry wheat will run through to feed a family for several days.

RAILROADS OF MANCHURIA

For the Year Ending March 31, 1926

Item	South Manchurian Railway
Average miles operated	695
Employees and equipment:	
Number of employees	36,246
Number of locomotives	425
Number of passenger cars	430
Number of freight cars	6,642
Services:	
Passengers carried—all classes	9,109,004
Tons of freight carried	16,850,727
Tons of freight carried one mile	3,713,979,670
Train miles	8,201,682
Locomotive miles	9,733,072
Results of operation:	
Operating revenues	$48,551,521
Operating expenses	19,342,144
Net operating revenue	29,209,377
Operating ratio—per cent	39.84
Charges:	
Passenger revenues	6,661,885
Average receipts per passenger—all classes	0.73
Average receipts per passenger mile—all classes	1.201¢
Freight revenue	40,147,106
Average receipts per ton mile	1.082¢

Source: Annual report of Department of Railways, Government of Japan, for the year ending March 31, 1926.

KOREA [1]

The first twenty miles of road in Korea were opened in 1899. Several railroads were built by 1906 in which year they were purchased by the Japanese Government and placed under the control of the Railway Bureau of the Residency General established under the Japanese Protectorate. By 1910, 640 miles of railroad had been constructed. From 1910 to 1917 there was considerable extension of lines and some important bridges were built. In 1917 the railroads of Korea were transferred to the South Manchuria Railway, which had the management

[1] Korea is shown as Chosen on the map with China above.

of the state railroads of Korea, though the expenses of construction and improvement continued to be borne by the Government General, which retained a general supervision of such work, and received from the South Manchuria Railway Company an annual payment of from six to seven million yen in lieu of operating profits. This arrangement continued from 1917 to 1925, when the management of the Korean State Railways was again resumed by the Government General. In 1925 the Japanese Diet adopted a new program calling for an expenditure of two hundred and thirty million yen for the construction of some 860 miles of additional railroads in Korea to be completed in 1938. This action of the Japanese Diet was in recognition of the need of further extension of Korean railroads for strategic and economic purposes.

Freight rates in Korea are uniform with those in Japan, but special rates are granted on certain articles for the encouragement of industries and exports and for other purposes.

After the establishment of the Government General the importance of the development of private railroads was soon recognized and beginning in 1914 subsidies were granted to guarantee a return of from six per cent to eight per cent on the capital invested in private railroads. At the same time the laws and regulations governing the construction and operation of private railroads were modified so as to facilitate the use of available funds and the like. The result of this encouragement on the part of the Government was that in December, 1925, there were six companies, five of which were subsidized, and one individual engaged in private railway enterprises, with a total nominal capital of seventy-three million yen of which thirty-one million yen was paid up.

Thus far the private railroads have not shown favorable results, in part due to the short time they have been operating and in part due to industrial depression within the country.

RAILROADS OF CHOSEN

For the Year Ending March 31, 1926

Item	State System
Average miles operated	1,309
Capitalization or cost of construction	$137,921,565
Capitalization or cost of construction per mile	105,364
Employees and equipment:	
Number of employees	12,819
Number of locomotives	247
Number of passenger cars	592
Number of freight cars	2,766
Services:	
Passengers carried—all classes	18,214,062
Tons of freight carried	4,812,938
Tons of freight carried one mile	654,878,996
Train miles	5,673,836
Locomotive miles	6,549,255
Results of operation:	
Operating revenues	$ 23,579,688
Operating expenses	19,479,115
Net operating revenue	4,100,573
Operating ratio—per cent	82.61
Charges:	
Passenger revenues	7,626,491
Average receipts per passenger—all classes	0.42
Average receipts per passenger mile—all classes	1.285¢
Freight revenue	7,681,857
Average receipts per ton mile	1.173¢

Source: Annual report of Department of Railways, Government of Japan, for the year ending March 31, 1926.

JAPAN

Construction of railroads in Japan was begun by the State. The first line was opened in 1873. The first privately owned line was not completed until 1891, but by 1895 the privately controlled mileage was about one-third of the total mileage. The private companies were encouraged by the State, which guaranteed interest be-

tween four per cent and eight per cent, and in some cases made cash subsidies. In 1906 Japan seriously undertook the nationalization of its railroads in connection with the program for paying the Chinese war debt. In 1907 the Government adopted nationalization as a policy partly for military reasons, and partly because the terms of the concessions prevented the Government from making the reduction in rates which was regarded as necessary in the general interest of the country. The authorities had set forth the following benefits which they argued would be derived from nationalization: 1, the systematic operation of trains would make provision for through train service, the simplification of traffic arrangement, the promotion of efficiency of the service, and consequently an increase in the net revenue; 2, the unification of rates on through traffic, it was contended, would result in reduction of rates; 3, the standardization of permanent way and equipment appliances would permit the common use of materials among the various lines on the one hand, and would promote a development of the industry for supplying railway materials on the other hand; 4, the consolidation of all the roads under the government plan of nationalization would introduce immediate economies estimated at about two million yen a year. It was predicted that these economies would be realized by the reduction of salaries paid to high officials, by the elimination of expenditures required in the handling of joint traffic business, by the elimination of duplication in plant, by the reduction of stores kept in stock, and by the unrestricted flow of vehicles throughout the system.

In December, 1908, the Imperial Government Railroads were removed from the control of the Minister of Communications and assigned to a newly created admin-

istrative body, the Railway Board, which was made responsible directly to the Minister President of State for all matters relating not only to the state lines but also to the control of the private railroads.

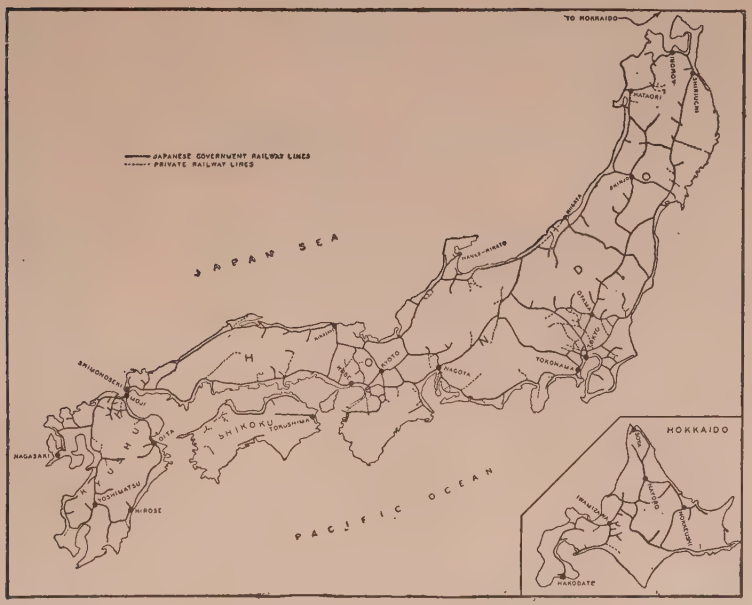
Under the plan of nationalization, the State acquired the railroads of seventeen companies having a total of 2823 miles. The price was twenty times the average rate of net profit on the cost of construction during the six semiannual business terms of the company ending the first half-year of 1905 inclusive, as multiplied by the cost of construction at the date of purchase. The result of this calculation was that the private companies received $83,000 a mile for their railroads or about twice the cost of construction.[1]

In 1909 there was effected a complete divorcement of the railway budget from the general account of the Government by the promulgation of the railway special account law. Some of the provisions of the law are: 1, capital shall consist of funds invested and to be invested in the railroads; 2, funds for extensions and improvements shall be provided from railway profit. If the profit is insufficient the Government may issue, at the charge of this account, public loans or make floating debts or it may issue short-term notes. The total amount of public loans and debts so raised for each year shall not exceed the annual estimates for extensions and improvements; 3, in case the cash in hand does not suffice to meet the payment of current expenses, a temporary loan may be made from the Treasury or notes redeemable within the same fiscal year may be issued.

On March 31, 1926, the Japanese Government was operating 7692 miles of railroad and 2887 miles was pri-

[1] F. K. Lane, "Construction of Railroads in New Lands," *Congressional Record*, 51: p. 2028.

vately operated. The government lines represented a capitalization of $1,246,327,073, the private lines a capitalization of $298,510,949. The capitalization per mile of government railroad was $159,029, while the capitalization of the privately operated railroads was $103,398



Railroads of Japan

per mile. The Japanese have maintained high standards of construction and maintenance. When they build a railroad they expect it to be permanent. The road is well ballasted, the power and equipment are kept in good condition, and the right of way is usually immaculate. There are imposing stations in the large cities. They have built many miles of riprap dry masonry which is as good as when laid a generation ago. Drainage ditches are laid with stone. Sliding cuts are faced with dry-stone

RAILROADS OF JAPAN
For the Year Ending March 31, 1926

Item	Private Railroads	State System
Average miles operated	2,887	7,692
Capitalization or cost of construction	$298,510,949	$1,246,327,073
Capitalization or cost of construction per mile	103,398	159,029
Employees and equipment:		
Number of employees	29,456	195,876
Number of locomotives	822	3,907
Number of passenger cars	2,762	10,308
Number of freight cars	9,439	59,607
Services:		
Passengers carried—all classes	233,826,575	677,085,503
Tons of freight carried	20,691,821	80,571,956
Tons of freight carried one mile	262,237,433	8,093,889,405
Train miles	14,403,337	92,752,637
Locomotive miles	.....	107,794,646
Results of operation:		
Operating revenues	$ 30,681,751	$ 239,504,776
Operating expenses	17,082,530	129,330,700
Net operating revenue	13,599,221	110,174,076
Operating ratio—per cent	55.68	54.00
Charges:		
Passenger revenues	18,853,784	112,588,799
Average receipts per passenger—all classes	0.08	0.17
Average receipts per passenger mile—all classes	1.446¢	0.967¢
Freight revenue	9,432,206	98,289,043
Average receipts per ton mile	3.605¢	1.215¢

Source: Annual report of Department of Railways, Government of Japan, for the year ending March 31, 1926.

masonry. Tunnels are two bore, well drained, and lined with brick.

The trains are run according to schedule. The passenger and freight rates are made up from zones. The rates are the same for the first fifty miles, then they are stepped up for the next fifty and again for each additional one hundred miles until four hundred miles are reached. There is no ticket collecting on the train. Tickets are shown before entering the train. If an employee violates a rule or instruction, he is punished first by dismissal from the service and then the Department of Justice may take up his case. The defendent is given a court trial and if found guilty he may be given a penitentiary sentence.

The financial showing of the Japanese railroads compares quite favorably with the best managed railroads in other countries. The operating ratio for the year ending March 31, 1926, on the Japanese State Railways was 54 per cent. In the matter of service an interesting innovation was reported several years ago.[2] During 1919 the Japanese Government Railway Bureau inaugurated the policy of guaranteeing freight delivery within a fixed period of time of all shipments. When a cargo is overdue or delay is caused in delivery, freight charges are rebated at officially fixed rates. When delay is within two days, ten per cent of the charges is rebated; when overdue beyond ten days, fifty per cent of the charges is repaid; when delay is caused by unavoidable circumstances, such as examination by police officers, custom authorities, or in case of accidents, railroads do not take any responsibility.

[2] *Railway Age,* Vol. 66, p. 866, 1919.

CHAPTER VII

SOUTH AMERICA

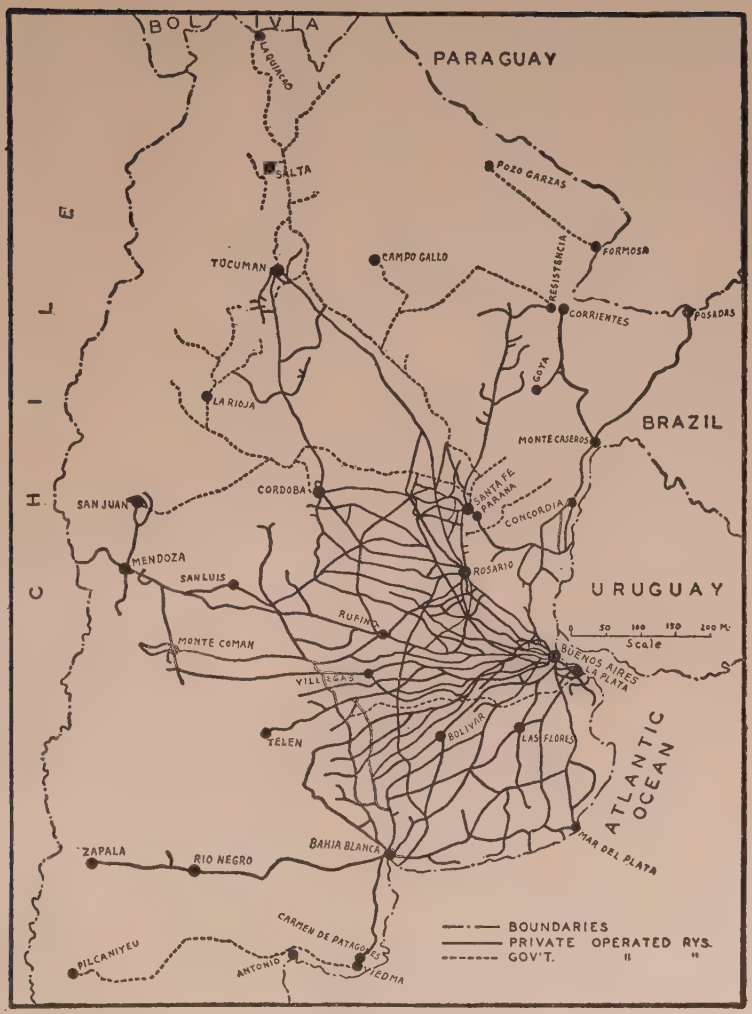
ARGENTINA

In the southern portion of the continent of South America is a vast republic which will obviously play an increasingly important rôle in the drama of world affairs. Argentina has 1,153,119 [1] square miles of territory and a population of about 10,000,000. The people who have settled this Southern Republic are enterprising Europeans. The impressive showing they have already made is in a large measure due to their success in developing a useful railway network.

In August, 1857, the first railroad in Argentina was opened. It was only six miles in length. The early railway lines of Argentina were built when the country was relatively poor in surplus capital. As in other countries where it was difficult to obtain credit for railway construction, the Government lent its assistance to the early projects. The first railway lines in Argentina were constructed under guarantees or cash subsidies from the Government, and in some cases with large grants of land along the right of way. The interest guarantees were usually seven per cent. Later these guarantees were relinquished, and in return the Government granted bonds in settlement.

Two forces operated to stimulate railway construction in Argentina. One was economic, the other political. In response to the demand for railroads to bring agricul-

[1] Areas of Latin American countries are given on the authority of the *Statesman's Year Book*, 1927.



Railroads of Argentina

tural and pastoral products down to the seaports, private capital was forthcoming largely from foreign investors. The Government desired to develop remote regions, which did not promise sufficient tonnage to attract pri-

vate capital. The Government was also interested in railroads for military purposes along routes which promised too little of commercial development to tempt the speculator, much less the investor. The State undertook the construction of some railroads in response to political considerations.

Of the approximately 24,000 miles of railroad in Argentina, more than 19,000 miles are privately owned and less than 5000 miles are state owned. There are three privately owned systems: the British, the French, and the Argentine. British investors own 15,670 miles or about two-thirds of the total mileage. French companies own about 2500 miles of line. The only railroad in Argentina owned by native investors and also under Argentine private management, is the Buenos Aires Central Railway with almost 300 miles of line. The state-owned railroads consist of 345 miles belonging to the province of Buenos Aires, and 4050 miles owned or leased by the Argentine Government.

The following table shows the railway companies in Argentina which are owned and operated by British investors, the mileage of each company, the gauge of the railroad, the capital investment, and the operating ratio:

	Mileage	*Gauge*	*Capital Gold Pesos*	*Operating Ratio*
Southern	3,948	5′6″	278,086,335	62.04
Buenos Aires Pacific	3,362	5′6″	259,610,012	63.25
Central Argentine	3,305	5′6″	291,572,016	67.66
Western	1,882	5′6″	160,790,064	66.18
Northeast Argentine	752	4′8½″	30,741,693	78.06
Entre Rios	729	4′8½″	40,446,953	68.92
Central Cordoba	1,205	meter	108,384,535	74.04
Midland	322	meter	15,417,410	87.96
Rafaela Steam Tramway	53	meter	420,000	95.57
Transandine (Argentine)	112	meter	11,752,042	
Total	15,670			

The British-owned railroads all converge into the principal seaports. Each railroad serves a separate main zone, a fact which has usually eliminated the element of intensive competition. Before the World War, there was a regular increase in the amount of British capital invested in Argentine railroads. In 1915 the total British investment in these roads amounted to about £225,000,000. Since the Armistice only about £6,000,000 have been added. On June 30, 1924, the investment stood at £238,000,000. The returns upon this investment have been fairly steady and regularly rising from 4.2 per cent in 1910 to 5 per cent in 1923.

The Chilean and the Argentine sections of the Transandine Railway were joined in 1910. The Chilean Transandine Company, Ltd., operated the Chilean section, while the Buenos Aires & Pacific Railway administered the Argentine section which was owned by the Argentine Transandine Company. It was soon evident that it would be desirable to have a unified control for this short line, 250 kilometers in length, of uniform gauge and forming an important international link. Eventually arrangements were made between the two Governments and the two companies to enable the Argentine company to rescind their contract with the Buenos Aires & Pacific Railway and sign an agreement under which, as from May 13, 1923, the two sections were united under a joint administration.[2]

In order to carry out the policy of unification, the general manager of the Chilean Transandine was appointed general manager of the Argentine and Chilean

[2] *Railway Gazette,* First South American Railway Number, November 22, 1926, p. 95.

Transandine Railways. Since the Argentine Transandine Company resumed possession of the railroad the line has been worked at a loss.[3]

The following table shows the railway companies owned by the French investors and the mileage, the gauge, the investment, and the operating ratio of each company:

	Mileage	*Gauge*	*Capital Gold Pesos*	*Operating Ratio*
Rosario to Puerta Belgrano	513	5′6″	39,022,600	63.55
Province to Santa Fé..	1,188	meter	51,901,200	75.42
General of Buenos Aires	790	meter	46,968,473	92.67

French capitalists have invested about 140,000,000 gold pesos in Argentine railroads. The French-owned railroads have not on the whole been as successful financial ventures as the British-owned roads of Argentina. The chief reason for this has been the better location of the British-owned roads. With the development of the country the French lines have, during the past three or four years, shown a marked improvement.

The only privately owned railroad in Argentina which is both owned and operated by citizens of the Republic, is the Buenos Aires Central Railway with 292 miles of line, representing an investment of upwards of £4,000,000 and showing an operating ratio in 1923 of 60 per cent and in 1924 of 55 per cent.

The following table shows the state-owned railroads in Argentina with the mileage, the gauge, the investment, and the operating ratio of each railroad:

[3] *Killik's Argentine Railway Manual,* 1926, p. 25.

	Mileage	Gauge	Capital Gold Pesos	Operating Ratio
San Antonio	281	5′ 6″	11,954,238	60
Comodoro Rivadavia	124	5′ 6″	4,618,109	78
Puerto Deseado	178	5′ 6″	5,568,738	96
Diamante to Federal	104	4′ 8½″	5,425,086	106
North Central Argentine	3,055	meter	160,988,560	100.4
Formosa	186	meter	5,156,315	105
Central of Chubut	78	meter	1,629,936	
Rosario-Fuentes	31	meter	792,000	
San Nicolas-Arroyo Dulce	12	meter	88,000	
Total	4,049			
Provincal Railway				
La Plata-Meridiano Quinto	345	meter	12,497,678	
Privately owned and managed railway				
Central of Buenos Aires	292	4′ 8½″	20,568,600	

After this survey of the ownership of railroads in Argentina, attention may be given to some of the notable developments in the construction and management of railroads in that country.

Among the Argentine railroads there are three gauges: wide, standard, and meter. No great inconveniences have arisen from this variety of gauges, the reason being the well-organized grouping of the different gauges and the fact that each group has complete access to the chief ports and commercial centers. The meter-gauge lines reach into the Northwest of the Republic and have access to Buenos Aires and the Pampas. The wide-gauge systems cover the center and south of the country, reaching also as far north as Tucuman. The standard-gauge lines lie chiefly in the region between the Uruguay and Parana rivers, and also have access to Buenos Aires. The extensions now planned will further increase the efficiency of the systems.

An interesting story attaches to the first railroad in Argentina. In 1856 agents were commissioned to purchase

the permanent way and rolling stock for the Buenos Aires Western Railway, to extend four and one-half miles between Buenos Aires and Floresta. The agents' demands were modest, for they needed only five miles of track and two locomotives. But the Crimean War was engaging the attention of European manufacturers who scorned the inconsequential order. Then the war ended and a quantity of surplus railway material used by the allied armies came into the market. It was intended that this material should be forwarded to British India, where the broad gauge rules, but, as the Argentine contract did not specify the gauge and as this was the first line in the country, advantage was taken of the opportunity. Two broad-gauge locomotives and five miles of track were purchased, and these were duly shipped to Buenos Aires.

In 1915 a law was passed creating a compulsory retirement and pensions fund for all railway employees in the Republic. Decrees in 1917 placed the entire personnel of all railroads in Argentina under the direct supervision of the Government.

All of the privately owned railroads in Argentina are organized as Argentine corporations under concessions from any Argentine Provincial Government or from the Federal Government. In the case of the foreign-owned companies each has an additional directorate in London or Paris. All railroads in Argentina operating in territories or beyond the confines of any one province are subject to the supervision of the National Railway Administration, which began its existence with a presidential decree issued in July, 1888. The Board of Control was primarily created to pass upon the hundreds of applications for railway concessions. Now all roads serving the territories or doing business between provinces must submit to the Administration of Railways regular reports

of operation and finance. The Railway Administration also has jurisdiction over tariffs, extensions, improvements, purchases of new equipment, and the construction of new buildings or interprovincial and territorial lines. As a means of encouragement to railway construction, the Government, under a law of 1907, relieves the privately owned railroads from payment of customs duties on materials and from other federal or provincial taxes, in return for which the roads are required to turn over to the Government three per cent of their net annual receipts. This amount seems to constitute a special fund, which the Government applies to the construction and maintenance of roads and bridges in the regions served by the railroads.

Turning now to the government-owned lines, mention should be made of the fact that the Government at one time owned three railroads which were later sold to British-owned systems. One of these was built by the Government under a law of 1868 and by 1875 it extended 158 miles. In 1872 the Government built a section of road from Cordoba to Tucuman. In 1874 the Government contributed to the capital stock of the Entre Rios, and some six years later had to take over the line, which at that time was insignificant in length. In each case the property fell into a deplorable condition, and the Government made liberal guarantees of interest to the purchaser both on the purchase price and on additional capital necessary to make needed repairs, improvements, and extensions.

In 1907 the legislature of the province of Buenos Aires authorized the governor of the province to issue bonds and construct a railroad from the city of La Plata to the western boundary of the province with various branches to the south. The operation of the road was placed under

a limited liability company whose board of directors was composed of six members, three of whom were designated by the governor, and three by the concessionaires. The Government reserved the right to fix tariffs, and guaranteed a return of five per cent on any capital invested by the operating company. All earnings above ten per cent were to be turned into the general revenue of the province.

From 1912 to 1920 the operating ratio varied from 120 per cent to 150 per cent. Since 1920, the operating ratio has been: in 1921, 102 per cent; in 1922, 93 per cent; in 1923, 111 per cent.

Turning now to the federal lines, it should be stated that the present separate administration of the state railroads was created under the law of October, 1909. This law provides that the President of the Republic shall name a General Administrator of State Railways who will work under the Minister of Public Works, and administer all matters relating to the operation of railway lines owned by the National Government. The law specifies that three per cent of the net receipts of the state railroads shall be set aside for road construction as provided in the case of private railroads.

In financing the state railroads, the Government up to 1920 had included in the budget sufficient funds to meet the deficits. Since 1920 the deficits have formed a floating debt that, on February 29, 1924, had reached the sum of 58,428,000 pesos.

As seen from the table above which shows the government-owned railroads of Argentina, the North Central Argentine Railway is by far the most extensive of all the government lines. From the port of Santa Fé it extends to the west and northwest, with numerous branches covering the important provinces in the north of the Re-

RAILROADS OF ARGENTINA

For the Year Ending June 30, 1926

Item	Private Railroads	State System *
Average miles operated	15,329	3,839
Capitalization or cost of construction	$1,050,060,797	.....
Capitalization or cost of construction per mile	68,502	.....
Employees and equipment:		
Number of employees	95,656	18,069
Number of locomotives	2,873	641
Number of passenger cars	3,737	576
Number of freight cars	63,422	11,442
Services:		
Passengers carried—all classes	135,755,101	2,976,722
Tons of freight carried	32,139,780	4,527,372
Tons of freight carried one mile	.....	736,983,262
Train miles	43,056,360	10,567,915
Results of operation:		
Operating revenues	$ 206,313,920	$17,981,871
Operating expenses	139,005,363	17,737,069
Net operating revenue	67,308,557	244,802
Operating ratio—per cent	67.38	98.64
Charges:		
Passenger revenues	46,499,316	2,746,017
Average receipts per passenger—all classes	.....	0.92
Average receipts per passenger mile—all classes	.....	2.694¢
Freight revenue	130,887,735	13,726,415
Average receipts per ton mile	.....	1.863¢
Taxes	2,087,800	.....

Sources: Private Railroads—Annual Reports of the Directors to the Proprietors of each Company. State System—Railways of South America—U. S Department of Commerce.

* For the Year ending December 31, 1923.

public. It reaches the Federal capital over other lines. Its western terminals are in the Andean provinces. In the north it has connection with the railroads of Bolivia. Many of the sections of this system were constructed through sparsely settled regions with the one object of developing the country. The operating ratio in 1923 was 100.4 per cent.

The other government railroads may be said to have been built to serve lumber districts, or as being built through a sparsely settled area, or to serve local irrigated districts, or to form an outlet for the central region, or to serve the sheep ranges of Patagonia and to open up the foothills and valleys of the Andes to agriculture, or

to reach petroleum districts—all in the interest of the development of the unity of the provinces of the Republic.

For the year ending June 30, 1927, there was a record-breaking crop movement in Argentina. About fifty per cent of the tonnage carried each year by Argentine lines consists of the cereals—wheat, corn, linseed, and oats. New investment was made to the amount of $25,000,000, a part of which went into the construction of 98 miles of new line. Net operating revenue increased $6,000,000, or 8.4 per cent. The British-owned lines paid dividends ranging from 6 per cent to 8 per cent, with the exception of 2 per cent on the Cordoba Central.

BRAZIL

The railroads of Brazil are for the most part government owned and operated. The different railway systems converge upon the coast line of Brazil, each of the three sectors being about one thousand miles long and each closing upon a major seaport. These port cities from north to south are Belem, which focuses the Amazon traffic at its huge delta; Recife, which is America's most easterly city; Rio de Janeiro, within an exquisite and landlocked bay more than sixteen miles long; and finally Rio Grande do Sul, by the Uruguayan border. There are other important railway termini along the coast, as Bahia in the North or Sao Francisco in the South. Each of the three sectors marks a different stage of progress in the program of interstate communication.

The Southern sector is covered by five States extending from the Uruguayan border to Rio de Janeiro. These five Southern States have been connected by rail. The north and south trunk line serves also as the backbone to secondary systems originating within each State. Along the middle sector from Rio de Janeiro north to

Railroads of Brazil

Recife, about half the distance can be covered by rail, although the railway lines have been built in the first instance for purely local service and will need consider-

able readjustment before they attain to the standards of a trunk-line service. On the third and most northerly sector between Recife and the Amazon delta, there are only short lines, which run inland from isolated harbors. These harbors are connected by coastwise steamship service, which is subsidized by the Federal Government.

In the more progressive South, a plateau, the Serra do Mar, about three thousand feet high, rises abruptly from the coastal plain for nearly one thousand miles along the Atlantic. It presents so formidable a barrier to railroads seeking the ocean, that so far it has been scaled by only seven lines, four of which run out of Rio Bay. The Leopoldina (a British-owned railroad) has two entrances to Rio and operates 1858 miles, being the largest single railway system in Brazil. Another British line comes down to the sea at Sao Paulo, and each year carries, on an average, ten million sacks of coffee, over one-half of the world's supply. Two state roads ascend the plateau from the ports of Paranagua and Sao Francisco, serving the States of Parana and St. Catharina respectively.

Certain lines have been built not primarily to attract traffic, but for political or strategic reasons. Such are the Brazil Great Southern Railway, which parallels the Argentine frontier along the upper Uraguay River; also the Northwestern of Brazil Railway, which starts from the State of Sao Paulo and runs a single-track line for 870 miles, across Southern Matto Grosso to the Bolivian frontier. These railroads and others in like manner, including the Federal-owned-and-operated railroad between Rio and Sao Paulo, were constructed to safeguard the national interests as they were seen by the Government of the day. It is the loss on maintenance of such strategic or political lines added to the perennial demand for fresh construction or subsidies, that accounts for the heavy

deficits, that confront the Federal Ministry of Finance when the yearly accounts of the Railway Department are balanced.

A notable example of the effort of Brazil to equip herself with strategic railroads is the Madeira-Mamoré Railway. This highly interesting line was constructed to give Bolivia an outlet to the Atlantic via the Amazon in return for certain territorial concessions. This railroad of 226 miles bridges the obstacle to continued navigation presented by the rapids of the Madeira River. Its downstream terminus, Porto Velho, to which vessels of 7000 tons can ascend, is 1800 miles from Belem, the port of the Amazon delta. The railroad is the only link between the vast, fertile, and unpopulated valleys of the Upper and Lower Amazon. Its construction cost the Government over five million pounds. It is at present leased to an English Company which has spent another two million pounds in putting it into working order. It is the most isolated railroad in the world. The nearest answering whistle to its locomotives would come from La Paz, on the Bolivian plateau, or from the copper mines on the Peruvian Andes, 500 miles, as the condor flies, and two and one-half miles higher.

Brazil's transport problem is most interesting. Her distant provinces, ribboned by huge rivers, clamor for railroads to develop their vacant land and to connect them with the governing centers. But construction costs are high, the countryside is unpopulated, and almost every product they can offer in the interior will also grow within one hundred miles of the seaboard. Brazil relies almost entirely upon a single great export—coffee. To open up too much land to coffee culture would be to overstock the market and bring ruin to the country.

Railway construction began in Brazil about seventy years ago. The Government has extended every encour-

agement to railway construction, itself building a considerable portion of the existing lines. Subsidies from the Federal Government have been and are conceded to the lines weakest in traffic, or most expensive in operation, or both. The railroads that serve the flourishing coffee-growing districts of Sao Paulo are for the most part independent of a subsidy, and are privately operated. Two systems, the Mogyana and the Paulista, combine a high standard of service and equipment with good dividends. But most of the railroads sought the assistance of the Government in their early stages and many were so poorly located, so far as traffic possibilities are concerned, as to make them a permanent burden upon the Federal Treasury.

So far as one can gather from the data available in this country, the policy in Brazil has from the first been for the Government to build and operate the railroads. Every year the government-owned lines increase in mileage due to the fact that they are taking over roads built by private enterprise or by States, roads which have proved to be unremunerative but which the State does not want to see abandoned. The Government, in deciding what roads to build, has been guided by military and strategic aims. Private enterprise has been attracted by economic opportunities. Operation of railroads by the Government in Brazil does not appear to be very efficient. Every year a huge railway deficit swells the general deficit of the Government. This is usually covered by interior debt bonds, with the result that Brazil has an enormous domestic debt. About three years ago a loan was placed in the United States for $60,000,000 with which to fund the floating debt. It is claimed that the money was not used for that purpose. In 1926 a loan of $80,000,000 was floated, one-half in England and one-

half in the United States, likewise for funding the floating indebtedness. It is difficult to ascertain just what is being done with that money. In 1922 the Brazilian Government borrowed $25,000,000 in the United States to electrify the Central Railroad. It is claimed that the money has been spent and no electrification has taken place.

One of the reasons for the enormous expenditures on the government railroads is the large personnel. This excessive number of employees they refuse to decrease. The roads are political in their management and they are used for purposes of patronage. Though the Government claims to build railroads to develop the country, the policy in managing the government lines rather defeats this purpose. Freight rates are so high that much of the traffic will move only short distances. For example, most of the potatoes consumed in Brazil are said to be imported from Italy, Spain, and other countries, because the high freight rates prohibit the shipment of products grown at relatively short distances from the coast. High freight rates tend to concentrate population along the coast and to retard opening up the back country.

It is questionable whether the Government has helped this situation by imposing a ten per cent tax on the existing tariff. The President in his annual message in 1926 pointed out that the Government was committed to a policy of strict economy in all public services. The Treasury was, therefore, cut off from the railroads as a source of funds and the railroads themselves were expected to furnish the capital required for plant and extensions. For this purpose a system of "Railway Debentures" was created. The certificates, bearing interest at seven per cent, are redeemable in ten years, provisions for payment being insured by a fund created with the proceeds of the

new ten per cent tax on the existing rates. The total issue of debentures during the year 1926 amounted to 50,000 contos, 32,000 approximately being intended for building work and 18,000 for additions to the plant, including an extension of the workshops.[1]

The Government has apparently taken a step toward real economy in creating a Railway Central Clearing House and by instructing the members to arrange among themselves for the exchange of rolling stock. Quite a few lines are already members of the Clearing House: Central of Brazil, South Mineira, Western of Minas, Marica, Leopoldina, Therezopolis, Paractatu, Victoria, Minas, and Rio d'Ouro. It is hoped that an end has been put to the antiquated system which has necessitated at each junction transhipment and fresh despatch of goods and which has made it necessary within the same country, within the same State, between lines belonging to the same Government to unload the cars of one railroad and reload the goods on cars of the other.

In connection with the Railway Central Clearing House the Government has established a Commission which, with the help of information received from the Clearing House, is to study questions of tariffs. The Commission includes representatives of the railroads, of commercial and industrial associations concerned, and of the Governments of the States affected by the cases under discussion.[2]

"The measure taken by the Government for establishing standard rates of tariffs to be adopted by all railways has proved to be of far-reaching importance in simplifying the tariff problems. These standards approved by

[1] *Railway Gazette,* Second South American Railway Number, December 6, 1926, p. 10.
[2] *Ibid.,* p. 11.

RAILROADS OF BRAZIL

For the Year Ending December 31, 1925

Item	Class I & II Railroads
Average miles operated	16,136
Employees and equipment:	
Number of employees	118,303
Number of locomotives	2,836
Number of passenger cars	3,297
Number of freight cars	38,512
Services:	
Passengers carried—all classes	119,170,890
Passengers carried—first class	45,461,838
Tons of freight carried	24,141,196
Tons of freight carried one mile	2,358,135,546
Results of operation:	
Operating revenues	$224,733,041
Operating expenses	193,000,308
Net operating revenue	31,732,733
Operating ratio—per cent	85.88
Charges:	
Passenger revenues	50,640,418
Average receipts per passenger—all classes	0.42
Average receipts per passenger mile—all classes	2.066¢
Freight revenue	136,835,290
Average receipts per ton mile	5.803¢

Source: Estatistica das Estradas de Ferro do Brasil, 1925.

the agreement of March 31, 1925, have been adopted by the railways belonging to the Railway Central Clearing House, all those belonging to the Sao Paulo Clearing House, the Rio Grande do Sul system, the Great Western, and the Cearense system. This makes it probable that they will shortly be adopted by all the Brazilian railways, thus putting an end to the contradictions and lack of system at present existing in connection with tariffs."[3]

Mention should be made of the outstanding feature which distinguishes the San Paulo Railroad from other transportation systems, which is the employment of rope haulage over a section of line 11 kilometers in length on

[3] *Ibid.*, p. 58.

the New Serra incline and 8½ kilometers in length on the Old Serra inclines. Perhaps no other railroad in the world worked either by rope or rack can be quoted which handles 6000 tons of goods per day in the uphill direction alone, as well as 60 bogie passenger vehicles conveying an average of 3000 passengers daily in each direction over the rope or rack section.

The efficiency of Brazilian railroads increases in direct proportion as the roads approach private ownership and operation. For instance, those roads owned and operated by the Government are least efficient. Those owned by the Government but operated for the Government by private companies are somewhat more efficient, and those privately owned and operated are making money.

DISTRIBUTION OF MILEAGE ACCORDING TO OWNERSHIP

Owned by the Union	17,705.645 Km.	58.4%
Administered by the Union..8,562 Km..28.2 %		
Leased to States.....4,101 " ..13.5 %		
Leased to Private companies.5,043 " ..16.7 %		
Federal Concession	5,293,859 "	17.4%
With guaranteed interest....2,454 " .. 8.09%		
Without guaranteed interest.2,840 " .. 9.36%		
Owned by States	1,880,422 "	6.2%
Administered by the States.1,742 " .. 5.7 %		
Leased ..... 138 " .. 5 %		
State Concessions	5,429.644 "	17.8%

SOUTH AMERICA

Country	Area Square Miles	Population	Total Railway Mileage	5 Ft. 6 In.	5 Ft. 3 In.	4 Ft. 8½ In.	3 Ft. 6 In.	Meter	3 Ft.	2 Ft. 6 In.	2 Ft.	Various
	Thousand			Gauge								
Argentina	1,153	10,000,000	23,728	13,786	....	1,879	....	7,323	....	....	....	740
Brazil	3,285	31,000,000	19,205	....	1,130	....	....	17,305	....	460	310	....
Bolivia	514	3,000,000	1,449	....	....	....	....	1,315	....	96	....	38
Chile	290	3,800,000	5,960	1,950	....	437	276	1,755	....	936	....	606
Paraguay	62	850,000	517	....	....	274	....	48	....	....	....	195
Peru	532	4,600,000	2,081	....	....	1,208	22	15	315	....	41	480
Uruguay	72.2	1,700,000	1,654	....	....	1,654	....	....	....	....	....	....
Colombia	441	6,600,000	1,054	....	....	....	18	422	614	....	....	....
Venezuela	394	2,560,000	661	....	....	....	197	40	33	....	136	255
Ecuador	110	1,600,000	413	....	....	....	280	....	....	40	....	93
British Guiana	89	300,000	79	....	....	60	19	....	....	....	....	....
Dutch Guiana	54	140,000	108	....	....	....	....	108	....	....	....	....
French Guiana	35	44,000	Nil	....	....	....	....	....	....	....	....	....
	7,031.2	66,194,000	56,909	15,736	1,130	5,512	812	28,331	962	1,532	487	2,407

Source: *The Railway Gazette*, Second South American Railway Number, December 6, 1926, p. 4.
Area and population figures are from the *Statesman's Year Book*, 1927.

CHAPTER VIII

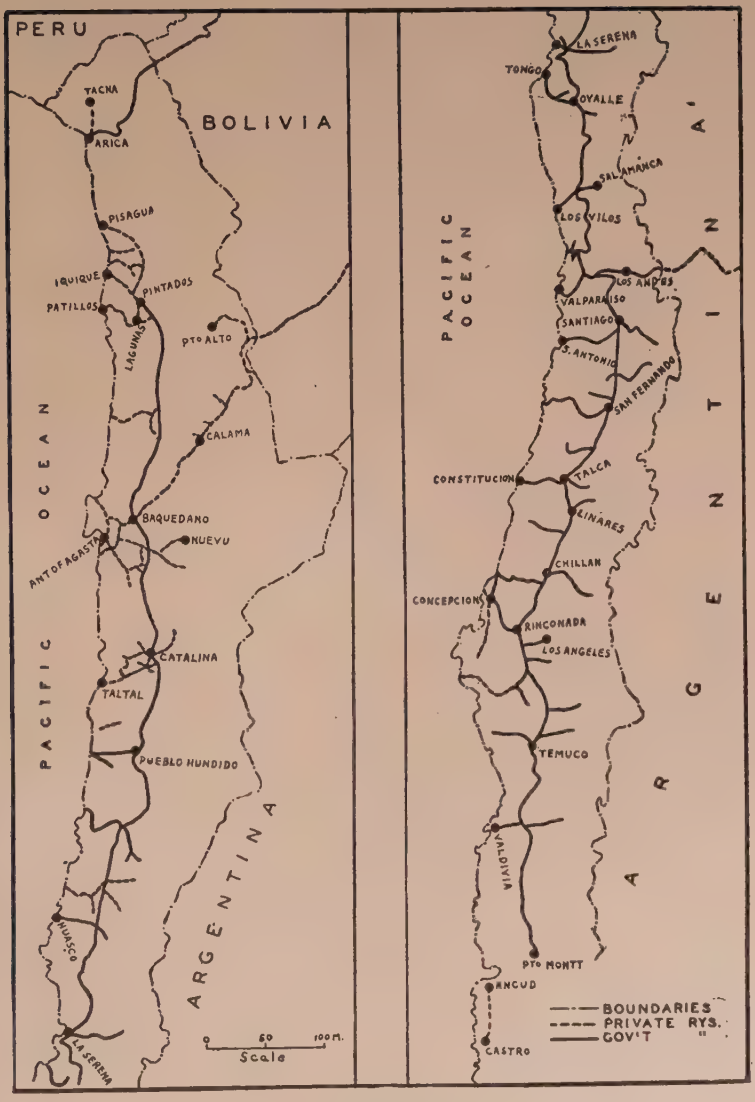
SOUTH AMERICA (*Continued*)

CHILE

For Chile the sea forms the natural transport route from north to south. Actually much of the tonnage moves by rail instead of by water. This is in part due to the fact that the Government does not, through a protectionist policy, reserve the coasting trade for national vessels, due in part to lack of modern port facilities, in part to the policy of state roads in making tariffs, and in part to the saving of time by use of railway transportation.

The railroads of Chile have been built to conform to the rather peculiar geographic and topographic characteristics of the country. There is a longitudinal line from north to south almost 3000 miles long. Then there are a series of transverse lines from east to west which, following the principal valleys, start in the Cordillera regions, cross the longitudinal railroad, and terminate at the seaports. There are now 6200 miles of railroad in Chile, 3770 miles or 61 per cent of the total being state owned.

"The pioneer railway in Chile was one built from Copiapo north of Coquimbo to the port of Caldera on the Pacific Ocean, which short line is especially notable as being the first to be built in any South American republic, and the second on South American soil; the first built in South America was one in British Guiana from Georgetown and opened in 1848. The Copiapo-



Railroads of Chile

Caldera Railway, which was 50¼ miles in length, and originally cost £60,600, was constructed essentially for the carriage of ores from the silver- and copper-mining area around Copiapo. It was opened in 1852 and the same year the then President of the Republic determined upon a policy of state-owned-and-operated railways in Chile, and subsequently authorized the construction of several railways." [1]

Parallel with the development of the mineral lines of the North zone, railroads were laid in the agricultural zone from Valparaiso to the South. The first surveys of the railroad from Valparaiso to Santiago were made in 1842 by an American engineer, Wheelwright, who had constructed the railroad from Copiapo to Caldera. In 1849 this project was sanctioned by a law of the Republic. In 1852 with private capital the construction company was formed and work was started that year. The first section was opened in 1855. Owing to the financial difficulties in which the construction company became involved, the Government of Chile acquired all the shares and took upon itself the continuation of construction and the operation of the part of the line already completed. In 1863 Santiago and Valparaiso were definitely joined by the railroad which had been largely built by the State and which was operated by the State.

The railroads from Santiago to the South were initiated, constructed, and operated by a Chilean Company on the section from Santiago to Curico, but passed into the possession of the State in 1873, whereupon the extension of the line from Curico to the South was continued.

[1] *Railway Gazette*, Second South American Railway Number, December 6, 1926, p. 72.

The acquisition and operation by the State of the railroads from Santiago to Valparaiso and from Santiago to the South clearly defined the zones of state and private influence in the construction of Chilean railroads. To private enterprise belonged the railroads of the North which were laid in the mining and saltpeter zones. State construction of railroads was first in the agricultural zone, and later in the unpopulated forest zone. When changes occurred in mining regions rendering private lines unprofitable, the State took them over. To-day private lines in Chile are confined to the saltpeter railroads of the North and to the recently opened coal mines of the South.

The Chilean Longitudinal Railway extends north to Iquique a distance of 1274 miles from Santiago and south to Puerto Montt, a distance of 1676 miles from the capital city. The journey to Iquique by express train occupies three days and twenty hours, the port of Antofagasta being reached in two days and twenty-one hours. For these long journeys the train services are not very frequent. Proceeding north there was in 1920 one train weekly giving direct service to Iquique, while there were two slow trains. Toward the South there is one express train daily and five slow trains to various points. Between Santiago and Valparaiso, where the road has been electrified, three express trains run each day and in addition there are two slow trains.

The management of state-owned railroads is in the hands of the President of the Republic and the Secretary of the Department of Public Works, Commerce, and Communication. They with the coöperation of Congress manage the affairs of the national railroad, but there is a supplementary body (the Chief Inspection

of Railways) called in government consultation in specific cases and which proceeds in accordance with the wishes of the Council of Ways of Communication.

This Council draws its membership from the Government, industry, commerce, agriculture, mining, government technical bureaus, workingmen's societies, private railway companies, and the Chilean state railroads. The Minister of Transportation is Chairman of the Council. Under the Council is the Superintendent of the Railroads. The Council, however, deals with all matters pertaining to rates, concessions, and technical regulations. The profits of private companies are assured in fixing rates. Whenever the net earnings exceed nine per cent on the actual capital represented by the property, the tenth per cent of the profits goes to a general railway fund, which is to be used in aiding less prosperous companies and in building new lines or improving existing roads. Instead of grouping a number of lines into a zone of uniform rates, the Chilean practice is to assign to each company the rates demanded by its peculiar conditions. Whenever the operating ratio of a given company falls below seventy per cent the Council is entitled to ask for a reduction in rates.

In 1914 a law was passed purporting to establish the financial autonomy of the state railroads, and making them independent of the fiscal budget. The law also provided that high posts should be filled by engineers from the State University. This was an effort to eliminate political recommendations. There seems to have been a marked improvement in the physical condition of the roads during the decade following the enactment of this statute.

The law of 1914 further provided that the state railroads must pay from their receipts interest on any

further capital invested for their own betterment. In 1921 and 1922 loans were negotiated for five million pounds sterling for acquisition of equipment and improvements, including electrification from Santiago to Valparaiso. This law also fixed the tariffs in gold currency, which were to be reduced to paper money by means of surcharges to be calculated every three months. Apart from the surcharges there have been general increases in the tariffs.

Under the law of 1925, the Council mentioned above was authorized to operate the state railroads. The Managing Council makes up its budget, borrows money and makes payment of interest on the funded debt, chooses and dismisses its employees, purchases material and equipment, and fixes its administrative and technical standards.

The charges against net revenue come mainly from interest on the funded debt and the operating shortage of the Red Norte, which is a road with 1075 miles of line, half strategic, half commercial, which upon its completion in 1917 was taken over by the State. The funded debt of the state railroads is almost totally constituted by bonds held in the United States. These bonds bear eight per cent interest.

"From statistical data, embracing both national and private lines for the year 1923, it appears that there is a total of $1,623,955,917 capital invested in the railways of Chile. Of this sum the Chilean Government's investment approximates $833,000,000, Chilean private capital $150,000,000, British capital $625,000,000, and American capital $15,000,000.[2] For comparison with this, it may

[2] These figures differ from those given in the table at the end of this section. The source of the figures here given is the *Railway Gazette*, December 6, 1926, p. 72, while those in the table are official.

be noted that the total earnings for the year 1923 were $351,810,627 and the expenditure $260,613,741.

"Eighty-five per cent of the passenger traffic and fifty per cent of the freight traffic is handled by the state lines. During the recent years, the bonds issued in behalf of Chilean railroads appear to have been largely transferred to investors in the United States."

In the financial administration of the railroads, the Council is independent to the point of being able to contract bank loans with government authorization to help out receipts, and one would expect a better financial showing for the state-owned lines. The rates should be so calculated as to enable the lines to operate without deficits; but each year there is a deficit and Congress periodically makes these deficits good. It has been said several times that the economic ills of the nation may be attributed to the recurrent and accumulative deficits of state-owned railroads. There has been a marked tendency toward increased efficiency and an apparent effort to reduce cost rather than to increase rates. For example at the end of 1925 there were about 1000 less employees than during 1924, while in 1926 the employees were reduced about 450; that is, to 23,750. The operating ratio on the government lines, however, is above 100. The operating ratio on the privately owned lines has averaged 70.7 per cent during the past six years. On April 28, 1927, the Government issued a decree authorizing the railroads to float a loan of $40,020,000. The proceeds are to be used to redeem the outstanding bonds which aggregate $22,032,000 and the balance is to be used for permanent improvements. There is considerable dissatisfaction with rates and the employees appear to be discontented, alleging that they are receiving less on the state lines than wages in similar lines of employment.

RAILROADS OF CHILE

For the Year Ending December 31, 1925

Item	Private Railroads	State System	All Railroads
Average miles operated	1,977	3,392	5,369
Capitalization or cost of construction	$278,341,605	$409,960,321	$688,301,926
Capitalization or cost of construction per mile	140,790	120,850	128,199
Employees and equipment:			
Number of employees	11,761	26,765	38,526
Number of locomotives	300	589	889
Number of passenger cars	230	672	902
Number of freight cars	10,630	9,081	19,711
Services:			
Passengers carried—all classes	3,430,883	13,252,452	16,683,335
Passengers carried—first class	339,601	1,501,065	1,840,666
Tons of freight carried	15,613,785	6,207,937	21,821,722
Results of operation:			
Operating revenues	$60,338,909	$89,046,783	$149,385,692
Operating expenses	43,906,906	88,361,759	132,268,665
Net operating revenue	16,432,003	685,024	17,117,027
Operating ratio—per cent	72.77	99.23	88.54

Source: Annuario Estatistico de la Republica de Chile, Comunicaciones, Ano 1925.

BOLIVIA, COLOMBIA, ECUADOR, GUIANAS, PARAGUAY, URUGUAY, PERU, AND VENEZUELA

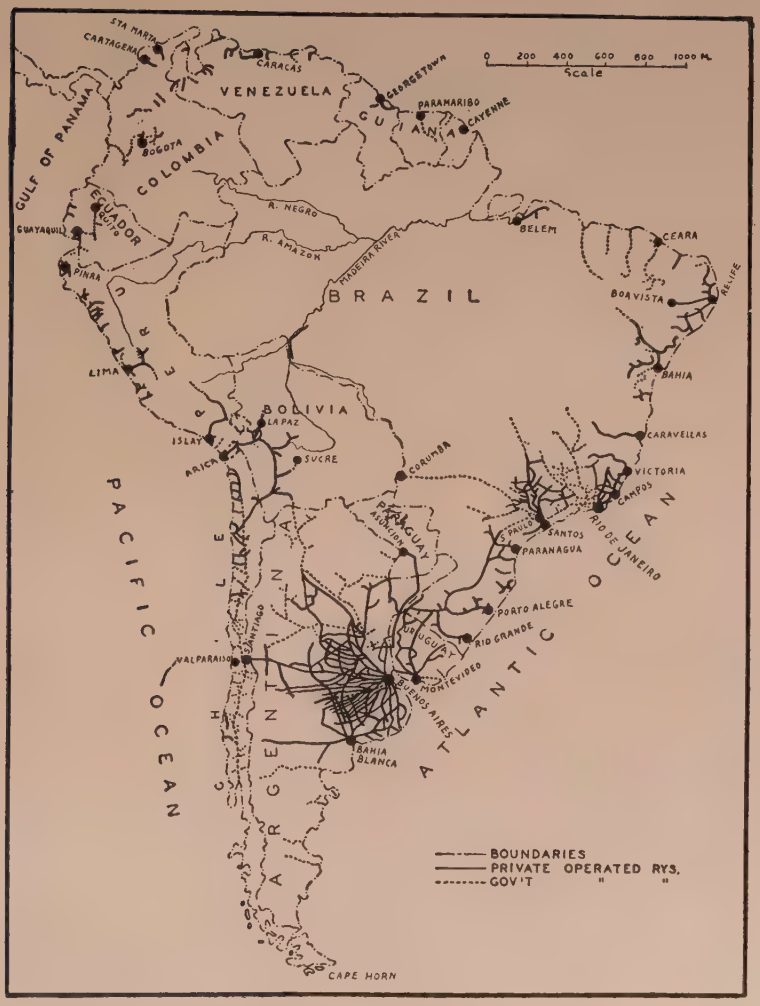
Bolivia

This is a country of vast territory, having 514,155 square miles. The population is estimated at three million. The 1500 miles of railroad have been constructed in the main by the Government and under government guarantees of interest and repayment of the principal of railway bonds. In order to raise money for building railroads, the Government under a law of 1900 pledged the proceeds of the alcohol monopoly and a tax on rubber. After 1910, the Bolivian Government found its pledge of the earnings of another railway project together with a special tax on beer and "muko" insufficient to meet interest on the bonds. The Government was called upon to make good its guarantees. In a compromise with the bondholders the Government was relieved of creating a sinking fund to retire the bonds. There has been great difficulty in financing Bolivian railroads. The Government has no little trouble in operating railroads. One of the principal roads was relinquished by the Government to the Peruvian Corporation.

Colombia

About one third of the 1100 miles of railroad in Colombia is operated by private owners. One-half of the mileage is owned by the Federal Government and about one-sixth by the Departments. The present policy of the Colombian Government is to nationalize its railroads and to construct all additional roads under its own auspices.

Colombia has pursued a vacillating policy with reference to the nationalization of her railroads. Prior to



Railroads of South America

1900 the Government granted concessions to certain railroads, agreeing to subsidize them, and providing that after a certain time the Government should obtain control of the railroads. After the Civil War of 1905, the

Government passed the first law taking over the railroads. In 1909 this law was rescinded and the lines which the Government was operating were returned to their original owners. The policy of railway nationalization now being carried out came into force in 1922 when the Northern Railroad was taken over by the Government. On March 1, 1922, the treaty authorizing payment of $25,000,000 in settlement of the Panama Canal claims was exchanged by the Governments of Colombia and the United States. In a series of loans the Government allocated for railway construction nearly two million dollars in excess of the twenty-five million dollars' indemnity received from the United States. Up to April, 1925, there had been expended by the Colombian Government 11,500,000 pesos,[1] on different railway projects and as much as 6,000,000 pesos had been borrowed by each of two departments. It is understood that the Colombian Government is now trying to negotiate a loan for 50,000,000 pesos to be used in railway construction.

An account of the building of a section of Central Northern Railway is typical of railway history in Colombia. The original concession was granted in 1884, but after two and one-half miles were laid work was abandoned on account of civil war. In 1900 a very liberal concession was granted to the Great Northern Railway for the construction of ninety-seven miles from Puerto Wilches to Bucaramonga. By 1910 twelve miles had been laid and no more was done until 1917. In 1917 the Government provided that five per cent of the customs should go to railway construction. The customs fell off and the Government had to meet its railway obligations by issuing internal debt bonds. A half-million pesos of these bonds were assigned to the Department of Santander for

[1] A Colombian peso equals $0.973.

work on this railroad. In 1921 the Government came into possession of the railroad and in 1923 it took the place of the Department in construction work. By January 1, 1926, thirty-one miles of track were in operation and seven miles additional had been constructed.

Ecuador

In June, 1925, Ecuador, with 109,978 square miles of territory and with an estimated population of a million and a half, had 652 miles of railroad in operation. Ecuador does not seem to have a definite policy with reference to railroads. The principal railroad of Ecuador, the Guayaquil and Quito Railway, is 278 miles in length and was completed in 1907 by Americans. In 1924 the road was considerably damaged by heavy rains. In order to pay for repairs the company asked authority to increase the tariffs twenty-five per cent. This the Government refused. After considerable negotiation the Government acquired enough shares of stock to give it control of the railroad. This railroad is on the three-foot-six-inch gauge. The journey between these points takes two days, twelve hours on the first day and nine hours on the second, passengers spending the night at Rio Bamba.

In 1924 only thirty-four miles of a total of forty-eight miles of the Bahia Quito Railway were in operation, due to damage from floods and lack of funds for repairs. It has been reported that the Government has agreed to take over and reconstruct an industrial line of sixteen miles in exchange for the free carriage of bananas. The Central Railway of Ecuador was built by English capital. It was begun in 1910 and was not completed until 1920. In 1923 the Government acquired control of the line and is now operating it.

British Guiana

British Guiana has 89,480 square miles of territory and an estimated population of 300,000. In 1922 the Government assumed control of 79 of the 107 miles of railroad. The former owners are to receive five per cent each year on the agreed valuation of $2,745,000. In 1923 the net deficit was $58,180.

The railroads which are operated by the Colonial Transport Department and administered by a managing director at Georgetown extend for 79 miles: 60½ miles on the four-foot-eight-and-one-half-inch gauge and 18½ miles on the three-foot-six-inch gauge. The net receipts in 1924 were $16,640.

Dutch Guiana

Dutch Guiana has 54,291 square miles and 140,000 estimated population. The only railroad is 107 miles in length, being operated between Paramaribo and Dam. It is owned and operated by the Colonial Government. A train is run each way once a week.

French Guiana

French Guiana with 34,740 square miles and an estimated population of 44,000 souls, may be said to have no railroads. It is true that there is a short line of twelve kilometers which runs from St. Jean, a penal settlement to St. Laurent de Maroni. The road has two or three locomotives which are rarely used. Since the road is a prison line running to the penitentiary at St. Jean, the prisoners are made to push or propel the cars.

Paraguay

Paraguay has 61,647 square miles of territory and an estimated population of less than one million. Altogether

Paraguay has about 520 miles of steam railroads. The Paraguay Central Railway has 274 miles of standard gauge. This is the only public railroad in Paraguay.

The first railroad in Paraguay was constructed by the Government, this being a five-foot-six-inch gauge line from Asuncion to Paraguari, opened in 1861. In 1889 the line was sold to a private company. Some extensions were made but development was slow and it was only in 1911 that the line reached Encarnacion on the Parana. By arrangement with the Argentine North Eastern Railway a third rail was placed in the Paraguayan broad-gauge track to permit the standard-gauge vehicles to run through between Asuncion and Encarnacion. For their part the Argentine North Eastern Railway introduced a train ferry on the River Parana, enabling standard-gauge stock to run through without interruption between Asuncion and Buenos Aires. Total receipts for the year ended June 30, 1925, were:

Working expenses	£110,996
Net receipts	139,178
Total	250,174

The operating ratio was 44.37 per cent as against 51.6 per cent in 1924. The increase of £50,000 in gross receipts over the figures for the previous year are attributed to general improvement of business in the country, to goods having been diverted from the river route owing to a strike, to a drop in the River Paraguay, and to a re-adjustment of goods classification. The majority of the remaining mileage belongs to logging roads operated solely for the use of industrial companies. The Paraguay Central Railway is owned by English capital. Freight rates at present are high. There is agitation for government regulation of rates. Under the general railway

RAILROADS OF PARAGUAY

For the Year Ending June 30, 1925

Item	Paraguay Central Railway
Average miles operated	274
Capitalization or cost of construction	$13,794,308
Capitalization or cost of construction per mile	50,344
Equipment:	
Number of locomotives	25
Number of passenger cars	47
Number of freight cars	483
Services:	
Passengers carried—all classes	464,869
Passengers carried—first class	193,513
Tons of freight carried	286,348
Tons of freight carried one mile	23,720,943
Train miles	244,183
Locomotive miles	430,753
Results of operation:	
Operating revenues	$1,217,472
Operating expenses	540,162
Net operating revenue	677,310
Operating ratio—per cent	44.37
Charges:	
Passenger revenues	324,080
Average receipts per passenger—all classes	0.62
Freight revenue	724,865
Average receipts per ton mile	3.056¢

Source: Annual Report of the Director to the Proprietors.

law of 1907, the Government is not permitted to interfere with rates prescribed by the railway company, except when the company's dividends exceed six per cent of its capital. The Paraguay Central has not attempted to fix its capitalization since the losses it incurred during the last revolution. Consequently there is no present method of determining whether or not the rates charged are too high.

Uruguay

Uruguay has a territory of 72,153 square miles and an estimated population of 1,678,000, served by a total of 1659 miles of railroad. The Government owns 143

RAILROADS OF URUGUAY

For the Year Ending June 30, 1926

Item	Central Uruguay Railroad	Northwest of Uruguay Railway
Average miles operated	980	113
Capitalization or cost of construction	$25,579,069	$6,063,416
Capitalization or cost of construction per mile	26,101	53,659
Equipment:		
Number of locomotives	133	17
Number of passenger cars	199	15
Number of freight cars	2,264	288
Services:		
Passengers carried—all classes	4,393,746	15,842
Tons of freight carried	1,443,339	59,987
Tons of freight carried one mile	181,397,738	4,186,635
Train miles	2,243,644	74,595
Locomotive miles	2,922,119	112,369
Results of operation:		
Operating revenues	$ 7,142,752	$ 409,978
Operating expenses	5,006,120	273,687
Net operating revenue	2,136,632	136,291
Operating ratio—per cent	63.45	66.76
Charges:		
Passenger revenues	2,243,165	51,346
Average receipts per passenger—all classes	0.51	3.24
Average receipts per passenger mile—all classes	2.496¢	6.109¢
Freight revenue	7,248,209	317,578
Average receipts per ton mile	4.238¢	7.586¢

Source: Annual Reports of the Directors to the Proprietors of each company.

miles with assets valued at 6,519,000 pesos. In the fiscal year 1924-1925 the Government suffered a loss of 127,000 pesos in the operation of the railroads.

The first railroad in Uruguay was that laid between Montevideo and Santa Lucia in 1872. It is incorporated in the Central of Uruguay system.

The Midland, North Western, and Northern Railways are owned by separate companies, but are administered as a complete system by a general manager located at Paysandu.

Peru

Peru has 532,047 square miles of territory and an estimated population of four and a half million. The first

railroad was opened to traffic in 1851. In 1925 the railway mileage had reached approximately 2090 miles of track in operation. Of this amount about 100 miles were electric street car and suburban lines. The Peruvian Corporation (Ltd.) controls the larger portion of the railroads, having received them through the settlement of the foreign debt in 1890. Some roads are operated by the Government, while there are a number of independent roads which are small and of little benefit to the country as a whole.

Only recently the Government considered the advisability of a railway system which would connect one end of the country with the other. Elaborate plans have been discussed, ambitious schemes have been proposed, and concessions have been made, but up to the present no action has been taken for the construction of such a system. Peru seems to be handicapped in securing sufficient funds for the project. If the funds are secured, it will likely be necessary to part with large land grants, inclusive of mineral rights.

A law of 1921, amended in 1923, provides for the issuance of bonds with the guarantee of the net revenues of the tobacco monopoly. In 1923 the Government was obliged to place additional loans because of the insufficiency of the net revenues from the tobacco monopoly.

The Peruvian Corporation (Ltd.) is the most important company in the operation of railroads in Peru. To understand the origin and privilege of this company one must go back to the beginning of Peruvian railway history. In order to finance railway construction, the Peruvian Government in 1869, 1870, and 1872 floated large issues of bonds in London. Peru's exports of nitrate and guano were pledged as security. These resources proved to be insufficient and in spite of various measures

of retrenchment, the Government suspended the payment of interest on these bonds in 1876. As the result of a war with Chile, which broke out in 1879, Peru lost the nitrate beds of Tarapaca and the southern guano deposits. The creditors pressed for an adjustment of obligations which in 1888 had increased to about £32,000,000 principal and to £23,000,000 accrued interest. As the result of negotiations the bondholders took over the railroad in 1890 with certain concessions granted them by the Peruvian Government. The Corporation now operates 1259 miles or more than two thirds of the total mileage in Peru, and is the principal railway system of the country.

The Government owns and operates five small railroads with a total of 309 miles. One of these roads of 62 miles the Government was forced to operate after the Senate failed to approve a lease to the Peruvian Corporation. In the national budget each year there appears an item to cover the deficit on the operation of this railroad (Ilo to Moquenqua). The Northwestern, which is 131 miles in length, was acquired in settlement of a dispute over financial differences between the owners and the Government. The other short lines operated by the Government seem to have been constructed by reason of political maneuvering.

Venezuela

Venezuela has a territory of 393,874 square miles and an estimated population of 2,563,000. The railway situation in Venezuela is peculiar for a Latin American republic. The Government plays no important part in the railway activities of Venezuela. The Government itself owns 66 miles of track, and these are all minor lines. The policy of nationalization so frequently found in

South American countries is entirely lacking. The most important railroads of the country and those best operated are all privately owned, and total 520 miles. Industrial lines have an aggregate of 160 miles.

CHAPTER IX

CENTRAL AMERICA AND MEXICO

CENTRAL AMERICA

While the territory of Central American republics is rather extensive, the railroads are in the main relatively short lines.

Guatemala and San Salvador with 55,529 square miles of territory and with a population of perhaps 3,600,000, together have less than 1000 miles of railroad. With the exception of a line of about thirty miles which serves a coffee-exporting company in Guatemala and another road of 100 miles in San Salvador, all the railroads of Guatemala and San Salvador are operated by a company chartered by the State of New Jersey under the name of the International Railways of Central America. This company obtained concessions from the governments of Guatemala and San Salvador in 1904, which carried free right of way, the right to charge gold for services rendered, an exclusive monopoly for twenty miles on each side of the right of way, a preference in the construction of railroads beyond this zone, freedom from taxes and duties on imported supplies, and a cash subsidy of $5000 per mile on some of the road and as much as $12,000 per mile on a portion. The operating ratio of the International for a decade after 1912 varied from 47 per cent to 63 per cent.

The Salvador Railways Company operates about 110 miles in addition to the lines of the International.

RAILROADS OF GUATEMALA AND SALVADOR

For the Year Ending December 31, 1926

Item	International Railways of Central America
Average miles operated	597
Capitalization or cost of construction	$68,079,878
Capitalization or cost of construction per mile	114,037
Equipment:	
Number of locomotives	97
Number of passenger cars	165
Number of freight cars	2,070
Services:	
Passengers carried—all classes	2,503,962
Passengers carried—first class	316,023
Tons of freight carried	646,715
Tons of freight carried one mile	46,587,438
Train miles	1,307,897
Locomotive miles	1,870,473
Results of operation:	
Operating revenues	$6,826,574
Operating expenses	4,130,824
Net operating revenue	2,695,750
Operating ratio—per cent	60.51
Charges:	
Passenger revenues	1,254,872
Average receipts per passenger—all classes	0.50
Average receipts per passenger mile—all classes	1.920¢
Freight revenue	4,518,434
Average receipts per ton mile	9.699¢
Taxes	269,011

Source: Annual Report of the International Railways of Central America.

In British Honduras there is a government-owned railroad twenty-five miles long. The deficit runs about $25,000 each year. Besides this, there are two short logging roads.

In Honduras an effort was made as early as 1852 to effect the construction of a railroad from ocean to ocean. Through a half century company after company failed to complete the project. Twice the Government equipped and attempted to operate the less than seventy-five miles.

Finally it was leased to a subsidiary of the Cuyamel Fruit Company of Delaware.

Honduras has about eight hundred miles of railroad which serve a population of perhaps 773,000 living within an area of 44,275 square miles.

Railroads of Central America

Citizens of the United States are especially interested in Nicaragua because of the proposal to construct a canal from ocean to ocean across the country. From 1878 to 1905 the Government of Nicaragua undertook the construction and operation of a railroad. After 1905 it was

operated for a few years by a private syndicate and then passed to a firm of New York bankers. They operated it from 1913 to 1920, and sold it back to the Government. Under the management of the New York banking house, the operating ratio fell to 58 per cent. Two years after the Government had bought back the railroad the operating ratio was 70 per cent. This road is 157 miles long in a country with 51,660 square miles of territory and 638,000 population. The only other railroads are short industrial lines operated by commercial companies in connection with their particular businesses.

In Costa Rica, the State constructed a railroad and opened it for service in October, 1910. From that time until the present the line has been administered by first one group and then another, until in 1921 an executive order delegated the management of the railroad to a Council of five members, including one engineer, one farmer, and one merchant. Earnings sufficient to return interest on the capital are not contemplated. The operating ratio was 107 per cent in 1913. Ten years later it was 95 per cent. The road is 86 miles long and the gauge is forty-two inches. The accounts are entirely separate from the general accounts of the public treasury.

There are 330 miles of line known as the Northern Railroad. In addition, the United Fruit Company has some railway mileage in Costa Rica which is an extension from Panama.

In Panama a road was completed from Colon to Panama in 1855 at a cost of $7,000,000. The stock of this railroad is now held by the Government of the United States. After the United States took over the railroad it was found necessary to construct an entirely new track part of the way and to construct an entirely new line on a higher level. There are 162 miles of line. The gauge

RAILROADS OF PANAMA

For the Year Ending June 30, 1927

Item	Panama Railroad
Average miles operated	48
Equipment:	
Number of locomotives	24
Number of passenger cars	62
Number of freight cars	1,061
Services:	
Passengers carried—all classes	495,773
Passengers carried—first class	184,430
Tons of freight carried	298,033
Tons of freight carried one mile	10,393,064
Train miles	179,258
Locomotive miles	294,994
Results of operation:	
Operating revenues	$1,638,754
Operating expenses	1,306,843
Net operating revenue	331,911
Operating ratio—per cent	79.75
Charges:	
Passenger revenues	438,268
Average receipts per passenger—all classes	0.89
Average receipts per passenger mile—all classes	2.390¢
Freight revenue	858,960
Average receipts per ton mile	8.260¢

Source: Annual Report of the Board of Directors of the Panama Railroad Company.

is five feet and the operating ratio in 1923 was 82 per cent.

In Panama there is also the Chiriqui Railway with about sixty miles of line completed in 1916 at a cost of $2,100,000. During the first five years the road was operated at a loss, which the Government assumed. In 1921 the management was committed to the Central Commission on Roads. During 1921 and 1922 the Commission incurred a slight loss on operations in addition to the outlay of $158,430 on repairs.

In addition to these two railroads the United Fruit Company operates 250 miles in Panama and Costa Rica, and there are several short industrial lines.

The Proposed Pan American Railroad

At the first International American Conference held in Washington in 1890, a resolution was adopted, which recommended the construction of an intercontinental railroad extending from New York to Buenos Aires, a distance of more than 10,000 miles, passing through the republics of Mexico, Guatemala, Honduras, Nicaragua, Costa Rica, Panama, Colombia, Ecuador, Peru, Bolivia, and Argentina. It is estimated that between sixty-five and seventy per cent of the entire road taking advantage of available lines, was completed prior to 1914. Since that date but few additional miles have been constructed.

At the present time railway communication exists between New York and the Mexican-Guatemalan border. This border is formed by the River Suchiate which has not been bridged. Across the river is Ayutla in Guatemala, the terminus of the International Railways of Central America. The Pan American line as projected will use the lines of the International in Guatemala to Zacapa, from which point the International proposes to build a line to the border of San Salvador. The International has a concession from the Republic of San Salvador to build to Santa Ana. Work is being done on this section of road. The International also has concessions to build to the border of Nicaragua and to a connection with the Pacific Railway of Nicaragua. The plans of the Pan American call for the utilization of the Pacific of Nicaragua as far as Granada. South to Granda but little construction is required. From Granada to the Colombian border new road will have to be built except for a few miles where the Pacific of Costa Rica and the Chiriqui of Panama may be utilized.

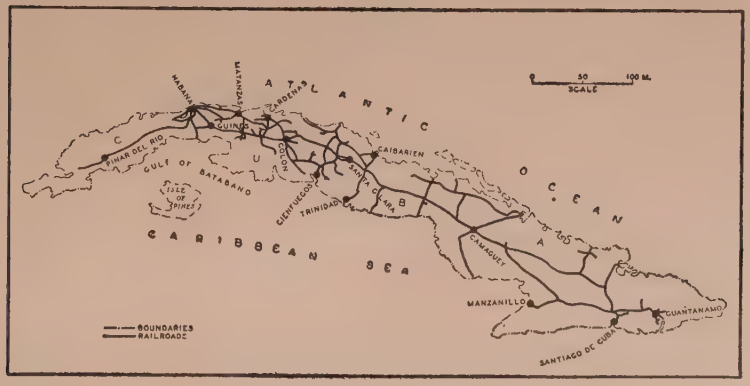
Recently a conference was held in the Pan American

Building in Washington in which plans for the Pan American Railroad were discussed.

CUBA

In the West Indies, with the exception of the island of Cuba, the railroads are insignificant in size.

The first Cuban railroad was opened to traffic in 1837, extending a distance of 45 miles. The system has gradu-



Railroads of Cuba

ally grown until now there are approximately 2650 miles in operation. Broadly speaking, the railroads of Cuba form two divisions: the Western which is a combination of lines under English control and the Eastern roads, which are practically all American. The greater portion of Cuban railroads are standard-gauge track. They are so arranged that they could be unified and the Government has appointed a committee to investigate the feasibility of such a proposition.

The sugar roads and industrial roads are not included in the above total mileage—they serve as feeders to the main lines.

The Government at one time considered nationalizing

RAILROADS OF CUBA

For the Year Ending June 30, 1925

Item	United Railways of Havana
Average miles operated	1,250
Capitalization or cost of construction	$105,290,504
Capitalization or cost of construction per mile	84,232
Equipment:	
Number of locomotives	382
Number of passenger cars	320
Number of freight cars	10,762
Services:	
Passengers carried—all classes	5,294,772
Passengers carried—first class	329,719
Tons of freight carried	18,503,613
Tons of freight carried one mile	497,974,988
Train miles	4,841,304
Locomotive miles	5,890,697
Results of operation:	
Operating revenues	$24,184,641
Operating expenses	14,887,767
Net operating revenue	9,296,874
Operating ratio—per cent	61.56
Charges:	
Passenger revenues	5,945,710
Average receipts per passenger—all classes	1.12
Average receipts per passenger mile—all classes	3.548¢
Freight revenue	13,911,158
Average receipts per ton mile	2.943¢

Source: Report of the Directors.

the railroads and a commission was appointed to make an investigation. But nothing definite has been done.

MEXICO

Mexico has 767,198 square miles of territory and an estimated population of 14,000,000. The 16,443 miles of railroad which serve Mexico have been constructed with capital obtained for the most part from foreign investors. From the beginning of railway construction in Mexico in 1842, foreign capital has been attracted by lucrative concessions and encouraged by government subsidies. Something more than two thirds of the railway

mileage of Mexico is controlled and operated by the National Railway System. The remaining one third of the lines is owned and operated by various independent companies and industries, with the exception of the small mileage owned and operated by various states and municipalities. Concessions have been granted from time to time for the construction of additional roads and branches to the extent of more than 5000 miles, but the most of these concessions have lapsed by reason of clauses stipulating that construction work should begin before a specified date.

The evolution of the National Railway System of Mexico makes an interesting story. A forerunner of this company, the Mexican National Railroad Company, received its first concession from President Diaz in 1877 which provided for a subsidy of 7000 pesos per kilometer on all the various lines of the company. The Government pledged to this subsidy the payment of six per cent of the gross amount of all its customs receipts. The Government further agreed to use railway construction certificates and to require merchants and others to settle at least six per cent of their accounts at the customs houses with these certificates. By December, 1883, this company had constructed 700 miles of line in Mexico and 180 miles in Texas. In 1888 the Texas Mexican Railroad was incorporated to run from Laredo to Corpus Cristi. Control of the road was maintained by the Mexican National Railroad Company through ownership of the majority of its shares of stock. In 1902 this railroad was transferred to the National Railroad Company of Mexico organized under the laws of Utah, and in 1908 it was again transferred to the National Railways of Mexico organized in Mexico. The Texas Mexican Railway has always been operated as a separate property under the laws of Texas,

but the majority of the stock is owned and voted by the National Railways of Mexico.

In 1884 the Mexican National Railway Company, which had received such favorable concessions from President Diaz in 1877, got into financial difficulties and defaulted in payment of all interest. Under a plan of reorganization a new company was formed and took possession in July, 1887. In 1901 under the readjustment procedure a corporation known as the National Railway Company of Mexico was organized under the laws of Utah and took over all the properties of the Mexican National Company. One of its obligations was to standardize the gauge throughout the system.

In 1882 the Huntington interests, having received a liberal concession from the Mexican Government, obtained a charter under the laws of the State of Connecticut incorporating the International Railroad Company. After the death of Mr. Huntington in 1901 the control of these properties was sold to the Mexican National Railroad Company.

During the years 1888 to 1910 the Mexican National Railroad Company acquired from time to time the properties of other companies including the Interoceanic Railway and the Mexican Southern Railway. The Mexican Southern was promoted by J. Gould under concessions which had been granted by the State of Oaxaca. At one time General U. S. Grant was president of this railroad. Under the terms of the contract of 1909 under which the Mexican Southern was leased to the National Railways of Mexico for seventy-nine years, a rental was provided to enable payment of dividends on the company's common stock beginning at three and one-half per cent in 1910 and gradually rising to five and one-half per cent in 1918.

Under the terms of a concession which was eventually acquired by English capitalists the Mexican Central Railway was constructed. The concessions provided that the company was to receive from $2000 to $15,000 in gold for each kilometer of track laid. In all nearly

Railroads of Mexico

$25,000,000 was paid to the Mexican Central Railway Company which constructed about 3000 miles by 1906. During 1906 the need of coöperation between the Mexican National Railway and the Mexican Central became so apparent that the Government obtained an option on the controlling shares of the Central which were held at that time by H. Clay Pierce of the United States.

In December, 1906, the Congress of the United Mexican States passed a resolution calling for the consolidation of the Mexican Central Railway Company, Limited, and the Mexican National Railway Company. The reso-

lution provided that the Federal Executive should be authorized to constitute by decree a Mexican stock company of limited responsibility which was to have for its object incorporation of these two railroads. The Federal Government was to have in its own right a majority of the common stock, which was to be obtained in exchange for stock held by the Government in the National Railways of Mexico. The resolution further provided that the Government should guarantee bonds of the new company bearing four per cent interest. These bonds were to be issued in an amount sufficient to meet the expenses of incorporation, necessary construction, purchase of new railway lines and betterment, and equipment of lines already existing or to be acquired.

Conforming to the terms of this resolution, President Diaz in July, 1907, signed a decree authorizing the combination of the two railway systems under the management of the National Railways Company of Mexico which should be formed by the Government and the stockholders of the old National and the Central. The new company was authorized to take charge of all kinds of transport by land or by water with industries or services connected or united therewith which it might deem desirable or lucrative and to this end to acquire and possess goods, chattels, and real property of all kinds and to construct railway lines within the National territory and execute works of all kinds. It was provided that the capital stock of the company at the beginning should be 460,000,000 pesos, of which common stock should constitute 150,000,000 pesos. The Government was always to hold a majority of the common stock. First preferred should be 60,000,000 pesos four per cent non-cumulative. Second preferred should be 250,000,000 pesos five per cent non-cumulative. It was provided that the

net profits remaining after the payment of the four per cent and five per cent to the first and second preferred stock respectively, should be divided between the second preferred stock and the common stock pro rata without distinction as to class. The decree also set forth that any payments the Government might be required to make under this guarantee of bonds should be considered as owing to the Government, and that interest at four per cent should be paid on such sums. It was also stipulated that the Government should not have the right to enforce payment of its debts by means of sequestration, intervention, liquidation, or judicial proceedings. In accordance with this decree an agreement was entered into in 1908 between banking houses in America and Germany and the security holders of the Mexican Central and the National Railroads of Mexico, under which 97½ per cent of the total securities of both railway companies were deposited with the bankers by June 30, 1909. At that date the system had the following mileage in operation as contrasted with the present mileage:

Main line and branches, standard gauge	Miles
Santiago to center of Rio Grande Bridge	801.999
Colonia to junction with main line at Santiago	2.960
Cintura line, Santiago to San Lazaro	3.162
Connection at Gonzales Junction	.034
Gonzales to Acambaro	52.945
San Juan Junction to Jaral del Valle	49.752
Connection with the "Y" at Salamanca	.581
Marehuala Branch, including Potrero Branch	40.521
Cintura extension, San Lazaro to Xico; branch to factories	3.221
Jarita Branch	19.138
San Juis de la Paz Branch	37.279
Matamoros Branch	205.724
Main line, Mexico to Ciudad Juarez	1,224.320
Tampico to Monterey and Gomez Palacio	548.115
Chicalote to Tampico	406.061
Guadalajara to Manzanillo	221.242
Irapuato to Ameca	216.860
Torreon to Saltillo	191.193
Mexico to Balsas	181.740
Jimenez to Rosario	95.626

Main line and branches, standard gauge—(*Continued*)	Miles
Lecheria to Apulco	87.738
Yurecuaro to Los Reyes	85.904
Pardeon to Saltillo	45.834
Tula to Pachuca	43.620
La Vega to San Marcos	29.205
San Bartolo to Rio Vere	26.319
Tepanacasco to Honey	21.849
Ocotlan to Atotonilco	21.700
Silao to Guanajuato	14.664
Mexican Union Railway, Rinconde Ramos to Cobra (leased line)	10.607
Telles to Pachuca	10.410
Brittingham to Dinamita	6.363
Tampico to La Barra	6.214
Cintura Railway of the City of Mexico	5.948
Adrian to Santa Barbara	5.197
San Luis Potosi to Hacienda de Benifico	5 188
Kilometer 1228 to Sulphur Mine	3.259
Santiago Branch, Mexico to the custom house	1.199
Total Standard Gauge	4,733.691
Main line and branches, narrow gauge	
Tacuba Junction to Urupan and extension to packing house "Popo"	318.719
Michoacan & Pacific Railway (leased line)	57.115
Peralvillo to Beristain	102.030
San Agustin to Irolo	17.523
Ventoquipa to Tortugas	16.666
Tepa to Pachuca	16.094
Total narrow gauge	527.947
Total main line and branches	5,261.638
Sidings and yards	684.660
Grand total	5,946.298
Tulancingo Tramway, narrow gauge	2.349
Texas Mexican Railway, standard gauge	161.853
Relinas-Decauville; To Los Reyes and Salinas	9.758

During the next four years, extensions and acquisitions were made, bringing the total mileage of the company within Mexico up to 7100 miles.

Following is a statement of the mileage of the National Railways and the operated lines for the fiscal year ended June 30, 1924:

Railway lines	Miles
National Railways	1,499.5
Central Railway	3,542.8
International Railroad	1,116.7
Interoceanic Railway	587.0
Hidalgo Railroad	162.9
Mexican Southern Railway	313.7
Vera Cruz & Isthmus Railway	340.4
Tehuantepec National Railway	188.6
Pan American Railroad	284.7
Mexican Union Railway	10.6
Mexican National Construction Company	30.4
Cienega do Los Caballos Railway	31.0
Mexican Eastern Railway	137.0
Alvarado Railway	43.5
Coahuila Coal Railway	24.4
Oaxaca to Ejutla Railway	44.8
Michoacan & Pacific Railway	57.1
Saltillo & Orient Railway	16.6
Calaverita Railway	6.4
Oaxaca Urban Tramways	7.4
Total	8,445.5

As a result of internal troubles, civil wars, and revolutions in Mexico, the railroads of that country have passed through a most trying decade. In 1914 President Huerta assumed control and operation of the National Railways of Mexico. After a revolution the Constitutionalist forces entered the capital in August, 1914, and all the property of the national lines, including general offices of the company, were seized. The following December, Presdient Carranza issued a decree under which the Constitutionalist Government assumed the direction, management, and administration of all the railway lines and their other properties of whatsoever nature situated in the territory controlled by the Government. In September, 1915, Carranza issued an order returning the railroads to their owners. On April 3, 1917, the Government again took over the National Mexican Railways and the Constitutionalists seized two or three other lines.

During this period of frequent changes in the Mexican Government, various efforts were made by security

holders to obtain adjustments under which they might secure interest on their bonds. An agreement was entered into in June, 1922, under which the bondholders made certain concessions and the Mexican Government undertook payment in cash on account of current interest on railway bonds. Toward the payment of interest due after January, 1923, the Government undertook to set aside annually: first the entire proceeds of the oil export tax; second, ten per cent of the gross revenues of the National Railways of Mexico; and third, the entire net operating revenues of such railroads. In any event the Government agreed to provide for current interest an annual fund amounting to not less than $15,000,000 U. S. gold during the first year and increasing by two and one-half million dollars for each of the ensuing years until the annual fund should reach $25,000,000. In order to make up any difference between the amounts of current interest annually due on the railway bonds and the cash payments to be made as agreed, the Mexican Government might issue script, which would bear interest at the rate of three per cent after the first fifteen years and which would mature in twenty years. It was further agreed that the Government should make prompt return of the National Railway System to private management and to the control of a Board of Directors agreed upon with the Committee representing the security holders, and the Government recognized its obligation to restore the railroads including equipment to their condition at the time the Government took them over.

Under this plan $13,500,000 U. S. gold was turned over to the Committee during the year 1923. On July 1, 1924, the Mexican Government failed to make payments due under the plan and agreement.

By February 10, 1925, all the roads of the National

Railway System were placed under the control of the Ministry of Communications which immediately placed in force regulations that would tend to decrease operating expenses. Wages were cut 15 per cent and a budget was drawn up which would allow 75 per cent of the gross income for operation and 25 per cent to be applied on the floating indebtedness.

The National Railway System of Mexico and operated lines, according to an agreement reached in New York on October 23, 1925, were returned to private management on January 1, 1926.[1] That is, the roads were to be operated by a so-called private company, the National Railways of Mexico, twelve of the twenty-one directors of which were to be appointed by the Mexican Government.

The system has been operated by the Government since it was taken over by the Constitutionalist Government on December 4, 1914. Under the new agreement the entire net receipts of the National Railways were to be sent monthly by the executive president to the office of the International Committee in New York. The income was not sufficient to pay the agreed amounts to the International Committee. The executive president in November, 1926, said, "The economic situation of the National Railways of Mexico in spite of efforts which have been made to bring about this reorganization is still far from permitting the company to meet its obligations."

In 1927 Sir Henry Thornton, head of the Canadian National Railway system, made a survey of the Mexican system. His report has not yet been made public, but the general belief seems to be that he will recommend

[1] W. Rodney Long, *Railway Age*, Vol. 82, No. 1, January 1, 1927, p. 46.

the organization of a private corporation to take over the operation and management of the Mexican National Railways and the roads operated by them.

During the past few years the Southern Pacific has effected settlements with the Mexican Government under which it has repaired and extended its lines into Mexico and has received considerable payments by reason of damages suffered during the revolutionary period. Through service is now available from Nogales, Arizona, to Guadalajara, Mexico. There are still pending with the Mexican Government claims of the Southern Pacific which have not yet been settled.

RAILROADS OF MEXICO

For the Year Ending December 31, 1925

Item	State System
Average miles operated	12,563
Equipment:	
Number of locomotives	1,565
Number of passenger cars	1,698
Number of freight cars	20,184
Services:	
Passengers carried—all classes	118,978,864
Tons of freight carried	14,780,410
Tons of freight carried one mile	2,211,736,813
Train miles	36,838,936
Results of operation:	
Operating revenues	$86,867,472
Operating expenses	80,917,426
Net operating revenue	5,950,046
Operating ratio—per cent	93.15
Charges:	
Passenger revenues	26,088,559
Average receipts per passenger—all classes	0.22
Average receipts per passenger mile—all classes	1.765¢
Freight revenue	48,777,969
Average receipts per ton mile	2.205¢

Source: Estadistica Comparada de la Explotacion de los Ferrocarriles de Jurisdiccion Federal.

CHAPTER X

GREAT BRITAIN

In England from the beginning of railway construction, railroads have been owned and operated by private companies. These companies have received practically no public aid.

The British railroad was established upon an analogy of the King's Highway. The proprietor of the roadbed and the carrier over it, it was thought, would be different persons. This conception proved to be based on false reasoning and a system of tolls was tried. This system also failed and in 1840 a Parliamentary Committee concluded that "an enlightened view of their own interests would always compel managers of railroads to have due regard to the general advantage of the public." Nevertheless, four years later a law was passed providing for the possible acquisition of railroads by the Government, which law is still in effect.

In 1843 there were seventy-one lines in England averaging in length about thirty miles. From 1844 to 1847 six hundred and thirty-seven companies were chartered. There were soon signs of extensive consolidation, and during the decade ending 1870 the public manifested considerable anxiety over the amalgamation of competing companies. By 1872 there were thirteen thousand miles of railroad in England and the number of companies had been reduced to twelve. That year a Committee reported that amalgamation had not brought with it the

evils that were anticipated, furthermore, that in any event long and varied experience had fully demonstrated the fact that while Parliament might hinder and thwart, it could not prevent amalgamation, and it was equally powerless to lay down any general rules determining its limits or character. The railway corporations for a time were left to grow, though it was assumed that sooner or later they would become so large as to assume relations with the Government corresponding to the public nature of their function. In 1888 the Railway and Canal Traffic Act either repealed or incorporated into itself all former laws for the regulation of railroads and created a regulating commission of five members. During the next twenty-five years the British Government developed regulation by the Commission which was supplemented by supervision of operation by the Board of Trade.

The relations between the Government and the railroads in England before the World War were not close. War broke out and within a few hours the Government took control of the entire railway system under the emergency act of 1871. It was agreed that the amount of compensation should be a sum equivalent to the net revenue of the companies for the year 1913; that is, approximately £46,000,000 per annum. The railroads were run for seven years under this arrangement.

During the War they carried government traffic free, they retained the income from other traffic and applied it to working expenses. The Government each year added the sum necessary to make up the guaranteed revenue.[1] From 1915 to 1918 the total revenue increased twenty-seven per cent and working expenses increased thirty-five per cent. Wage increases reached their maximum in 1918 and shorter hours went into effect in 1919. During the

[1] Acworth, "Railway Nationalization," p. 158.

War passenger rates were increased fifty per cent, but freight rates were not increased at all. The roads under government management incurred large deficits due to increased expenses. These deficits continued after the Armistice. In January, 1920, freight rates were increased from twenty-five per cent to one hundred per cent and extra charges were added to collection and delivery rates. The fact that the Government had operated the railroads during the War and for a period of seven years encouraged all who favored government ownership to hope that the properties would not be turned back to their owners but that the Government would continue to operate them.

The serious economic depression that followed the World War and the consequent falling off in tonnage on the British railroads coupled with the heavy deficits that had accumulated from war-time management brought about a most serious study of the relations that should obtain between the State and the railroads. The English authority, Sir William M. Acworth,[2] had come to the conclusion that closer connection than has hitherto existed between the State and its railroads has got to come both in England and in the United States. Hitherto, he said, in Anglo-Saxon democracies neither state ownership nor state control has been over-successful. The best success has been obtained by relying for control, not on the constable, but on the eventual supremacy of an enlightened public opinion. Sir William Acworth finally came around to the opinion that state ownership in England had become inevitable.[3] He said in England the position is this: "To leave private railway companies uncontrolled by the State is impossible. To establish a

[2] "Relation of Railways to the State," p. 11.
[3] Acworth, "The State in Relation to Railways in England," p. 7-9.

system of State control, which shall secure the freedom and flexibility of private enterprise, and thereby encourage development and the investment of fresh capital; and yet, at the same time, shall interfere to such an extent, and impose such restrictions, as will prevent individual citizens from being, and, still more, from feeling that they are the helpless subjects of a huge monopolistic organization, is a task of quite extraordinary difficulty. It is a task in which no Government has hitherto completely succeeded."

He added that in England confidence had been placed in competition as the main regulative force, and so far it had not been misplaced. But competition was dying and its effects must ere long die out too. New state regulation must be introduced, but so far no one had tried to work out a plan for this new regulation, and unless state control was properly organized state ownership was inevitable. If competition went, the main motive for lower rates to the public for the same service, or better service to the public for the same rates, would go too, and direct state action would become necessary to protect the public. The legislative and judicial branches of the State were not fitted for this task. Wide and arbitrary powers of compulsion would have to be given to the Executive Government. There were no signs of the establishment nor of a demand for the establishment of machinery necessary; if such signs existed the railway companies would resist them. He said that the conclusion that he most reluctantly arrived at was that the English could not go on as they were, that there was little hope for the establishment of an adequate and clearly thought out system of state control, and that, therefore, the only alternative, state ownership, was inevitable.

On being asked who favored nationalization, Sir William Acworth replied: "Railway proprietors, who, if their property was handed back to them, would be face to face with an almost hopeless financial situation, naturally desire it. The organized working classes are determined to have it. And where is an effective opposition to come from? Mere mental hostility does not command votes. The trading classes unquestionably dislike the idea of nationalization. But they dislike high rates still more. And it is clear that it is only by the abolition of competition and the consolidation of all the railways into one unified system or group of systems that large-scale economies can be effected. Unification on a non-competitive basis in private hands would never be tolerated by public opinion." [4]

The changes that would result from nationalization it was argued would be as follows:[5]

(1) In plant. Small independent systems would be abolished; the network would have to be made a real net covering a definite section of the country; junctions would be established; exchange sidings abolished; duplicate stations abandoned; due to increased labor cost, automatic signaling would be extended and mechanical appliances would be established in goods yards and sheds.

(2) In rolling stock. All rolling stock would be pooled; there would be a reduction in the construction of superfluous wagons and sidings and in the sorting and hauling of empties; it would be possible to decide on the most suitable types of wagons and locomotives and provide for standardized mass production.

[4] W. M. Acworth, 'Railway Nationalization," in *Quarterly Review*, No. 460, July, 1919, p. 167.
[5] *Ibid.*, pp. 170-171.

(3) There would be a bureau of standards in the engineering division.

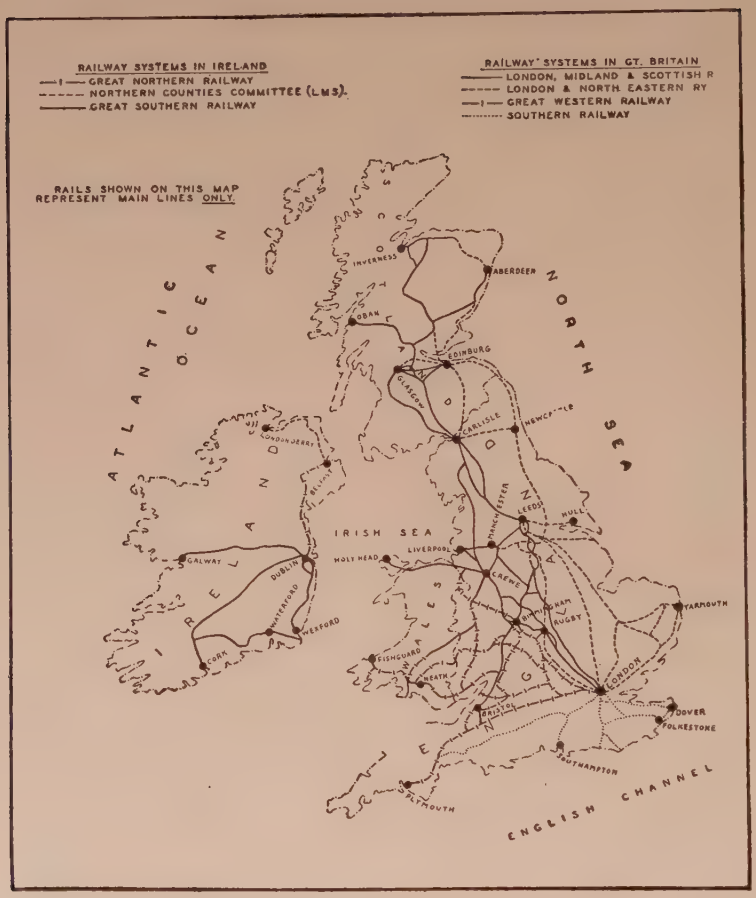
Yet the English people refused to enter upon the experiment of government ownership. Under the leadership of the Ministry of Transport headed by Sir Eric Geddes, a bill was drawn and carried through Parliament providing for the return of the railroads to their private owners. This law required the consolidation of the railroads of England, Scotland, and Wales into four systems. The law further provided that a sum of $291,600,000 should be set aside by the Government for the payment of all claims by the railroads which obtained at the end of the period of control. Under another provision of the law the Railway and Canal Commission or the Minister of Transport was given authority to require any railway company to afford reasonable services, facilities, and conveniences, which are proved to be necessary, unless the railway company can prove that such undertakings would effect prejudicially the interest of the stockholders. Rates are to be provided which yield the aggregate net revenue for 1913 plus a sum equal to five per cent on capital expenditures made by the railroads during government control. Authority over rates is vested in a Railway Rates Tribunal consisting of three permanent members. The chairman of the tribunal is to be a railway man, one of the members a lawyer, and the other a business man. They hold office for not more than seven years. The Rates Tribunal is clothed with very large powers. The law provides for the adjustment of labor disputes through a central wages board and a national wages board, the latter to consider appeals from the former.

Under this law the railroads of Great Britain were returned to their owners on August 16, 1921. They imme-

diately faced the greatest difficulties. Existing rates were conceded to be higher than the traffic could bear, wages had been increased about 200 per cent higher than they were before the war. There had been an abnormal decrease in traffic as a result of serious economic disturbances throughout western Europe. English business men and investors doubted the wisdom of compulsory consolidation. They regarded the scheme as grandiose and wholly foreign to previous policy in their country.[6] It was pointed out that railway systems in the United States which approach in size the groups outlined in the English railway bill have been developed gradually through a period of years and along economic lines. The English grouping on the other hand may be called a paper amalgamation based more upon theoretical and geographical lines than on practical and economic lines. "Thus," said one writer, "British railways are called upon to perform overnight, as it were, what the United States has done over a period of years." [7] It appears that consolidation of railroads in England has failed to produce economies. The benefits promised have not been realized. English experience demonstrates that permissive and gradual consolidation is preferable to any scheme of compulsory grouping.

In England, Wales, and Scotland there are now four systems, the Great Western, the London Midland & Scottish, the London and Northeastern, and the Southern. In 1926 they operated 20,000 miles of lines, 7600 miles being single track, 11,000 miles double track. If the total single track included sidings there would be 52,300 miles. The total capital expended upon these railroads is nearly $6,000,000,000.

[6] *Railway Age*, January 7, 1922, p. 76.
[7] Robert E. Thayer, *Railway Age*, January 7, 1922, p. 77.



Railroads of Great Britain and Ireland

With a revival of industry the British roads began to make better showings, particularly in 1925. In 1926 there was an unprecedented general strike on May 1, and a strike of the mine workers beginning also on May 1. These strikes greatly reduced the earnings of British railroads for 1926. The trade-union leaders made an admission that they committed a wrongful act in calling the

strike.[8] It was estimated that the revenues of the four systems in 1926 as compared with the revenues in 1925 were decreased £6,490,000.[9]

During 1927 the British railroads have been occupied with restoring confidence after the serious labor troubles of the previous year. The extent to which the financial resources of the four British companies had been depleted is shown by the following comparative statement of dividends:[10]

RAILWAY DIVIDENDS PAID ON ORDINARY STOCK

	1925 %	*1926* %
Great Western	7	3
London, Midland & Scottish	6	3
London & Northeastern		
preferred	5	0⅛
deferred	1	.
Southern		
preferred	5	5
deferred	3½	1¼

In order to pay the decreased dividends of 1926 the companies had to draw upon their reserves more than $50,000,000 (£17,000,000).

The following statement indicates the financial results of the operation during 1927:

COMPARATIVE STATEMENT OF PASSENGER- AND FREIGHT-TRAIN TRAFFIC RECEIPTS—1925 and 1927

45 Weeks Ended November 13, 1927

Railway	*Passenger Receipts (decrease since 1925)*	*Freight Receipts (increase since 1925)*	*Total (increase or decrease)*
Great Western	£ 654,000	£1,171,000	£ 517,000 (+)
London Midland & Scottish	2,121,000	1,881,000	240,000 (—)
London & Northeastern	1,524,000	2,600,000	1,076,000 (+)
Southern	495,000	96,000	899,000 (—)
Totals	£4,794,000 (—)	£5,748,000 (+)	£954,000 (+)

[8] *Railway Age,* January 1, 1927, p. 146.
[9] *Ibid.,* p. 147.
[10] *Ibid.,* January 7, 1928, pp. 110-111.

A gain of five and three-quarter million pounds in freight receipts in 1927 over a like period of 1925 was offset by a decrease of four million eight hundred thousand pounds in passenger receipts for the same period, leaving a gain in revenues of only nine hundred and fifty-four thousand pounds.

Much of the falling off in passenger business was due to the passing of dividends or curtailing dividends during 1926. People looking to dividends as an appreciable part of their income, curtailed travel by railroads in 1927.

With the object of attracting transit business, the group companies instituted "Circular Tours Tickets" available for two calendar months from date of issue, covering all places of interest throughout the United Kingdom, at a reduction of twenty-five per cent on the single fare from point to point. Excursion traffic at low fares has been developed by all railroads, particularly Sunday excursions. Some interesting non-stop ones were introduced, as for example from Paddington to Plymouth, a distance of 226 miles, from London to New Castle-on-Tyne, a distance of 268 miles, and from London to Carnforth, a distance of 236 miles. During the winter there is an express non-stop from London to Carlisle, a distance of 300 miles in five hours, fifty-five minutes (52 miles per hour).

The railway companies have applied to Parliament for authority to operate motor vehicles on the highways. They already enjoy such powers in some parts of Great Britain under legislation enacted some years ago, but in 1927 it was sought to extend the powers generally to place the railroads on an equal footing with operators of motor vehicles.

In Ireland there are three principal railway companies: the Belfast and County Down, the Great Northern, and

the Great Southern. It seems that in spite of tremendous difficulties resulting from the World War and the disturbed conditions following it, the British roads under private management are emerging from their perplexities.

RAILROADS OF GREAT BRITAIN

For the Year Ending December 31, 1926

Item	Private Railroads
Average miles operated	20,396
Capitalization or cost of construction	$5,703,854,162
Capitalization or cost of construction per mile	279,656
Employees and equipment:	
Number of employees	689,264
Number of locomotives	24,037
Number of passenger cars	72,777
Number of freight cars	773,295
Services:	
Passengers carried—all classes	1,541,879,621
Passengers carried—first class	81,444,609
Tons of freight carried	241,468,670
Tons of freight carried one mile	15,726,761,340
Train miles	346,523,253
Locomotive miles	501,744,039
Results of operation:	
Operating revenues	$836,318,921
Operating expenses	749,344,356
Net operating revenue	86,974,565
Operating ratio—per cent	89.60
Charges:	
Passenger revenues	333,987,058
Average receipts per passenger—all classes	0.33
Average receipts per passenger—first class	1.35
Freight revenue	413,868,149
Average receipts per ton mile	2.799¢

Source: Returns of Capital, Traffic, Receipts, and Working Expenditures, etc., of the Railway Companies of Great Britain for the year ending December 31, 1926.

CHAPTER XI

AFRICA

It might appear to be logical to treat the railroads of each foreign possession in Africa in connection with the railroads of the protectorate country. Since there is much larger mileage in the English Dominion of South Africa than in the others and since there is some advantage in viewing as a whole the railroads that serve the entire continent, at this point a brief account will be given of all railroads in Africa beginning with South Africa.

South Africa

South Africa will be used in this connection to include all the territories south of French Equatorial Africa and the Belgian Congo. That is, South Africa as here used includes the Union of South Africa, Rhodesia, Nyasaland, Tanganyika, Portuguese East and West Africa, Uganda and Kenya Colony. British South Africa together with Portuguese East and West Africa, and the French islands of Madagascar and Réunion to the east have approximately 19,000 miles of railroads or nearly one-half of the total mileage of the continent, although these roads serve less than a quarter of the total area. It is also noteworthy that in the southern territories the railroads have almost entirely adopted the three-foot-six-inch gauge and thus rendered possible easy and economic interchange of traffic.

Taking up the different territories of South Africa as

here defined, attention will first be directed to the Union of South Africa.

Union of South Africa

The largest railway system in South Africa is that owned and operated by the Union of South Africa. That system comprises over 12,200 miles or about one-third of the total railway mileage of the entire continent. Rail-

Railroads of South Africa

way construction in South Africa was begun in 1859. In 1860 the first railroad began operation. It was standard gauge about two miles long from Point to Durban in Natal. About that time construction was started in Cape Colony from Capetown to the Eerste River and then on to Wellington. By 1870 there were sixty-three miles of railroad in Cape Colony and six miles in Natal. In that year the diamond fields were discovered and the great Kimberley mines made necessary the extension of the

Cape lines northward. In 1873 the Cape Government took over the private railroads as a state undertaking and Natal followed suit in 1877. The three-foot-six-inch gauge was substituted in 1881 for the standard gauge. Under the stimulating impulse of the gold and diamond discoveries, railway construction proceeded and by 1897 Bulawayo in Rhodesia had been reached.

In the Transvaal railway progress was hampered by the opposition of the burghers who were afraid that the newfangled means of transportation would destroy their transport riding from which a great many obtained their livelihoods. Slowly through the nineties lines were extended into the Transvaal, the lure of the vast gold fields eventually compelling attention.

Following the war which broke out in 1899 the separate railroads of the Transvaal and the Orange Free State came under British influence. When hostilities ceased in 1902 there were three separate railway organizations with a combined total of 4895 miles. The disputes and difficulties incident to the construction and operation of South African roads eventually led to their unification. In 1910 when the railway system in the four provinces of Transvaal, Orange Free State, Natal, and the Cape were amalgamated, the mileage taken over by the Union Government was 7040 or about one-half the mileage at that time of the entire continent of Africa. In 1912 the General Manager of the Railways of the Union of South Africa reported 7850 miles of government railroads in operation, acquired and built by the Government at a cost of $395,000,000. By 1920 the state-owned railway mileage had increased to 9600 miles or 36 per cent despite the fact that the World War had retarded progress between 1914 and 1918. As a consequence of the Treaty of Versailles, the railroads in Southwest

Africa, a former German colony, have been incorporated into the Union System, adding 1331 miles and making the total 12,206 miles owned by the Union System. The system also operates an additional 418 miles of private lines. This total has been achieved through the enactment of construction programs since 1920 involving capital expenditure of about $45,000,000 for 1928 miles of line, 1072 miles of which have already been completed and 856 miles of which will likely be opened for traffic during 1929. It is not unlikely that a further construction program will receive consideration during 1928 or in 1929, as many members of Parliament representing country constituencies are still clamoring for branch lines to assist in opening up the outlying parts of the country.[1] The only railroads worked by private companies and not connected with the Union System are the Cape Copper Company's line of 108 miles (now not working) and the Southwestern Railway to Knysna of only 21 miles.

Success of the Union Railways is in a large measure due to the able leadership of Sir William Hoy, who first became prominent for pioneer work in the Transvaal from 1901 onward and subsequently for the reorganization of the Central South African Railways after the War. He was called upon to take charge of the Union System when the Cape, Natal, and Central South Africa Railways were amalgamated on the consummation of the Union in May, 1910. Sir William devoted his great administrative powers to the coördination of railway policy, and by extending his transportation scheme of organization to the unified system, paved the way for the railway development of South Africa that has proceeded during the recent years. It may be said that Sir

[1] *Railway Gazette,* November 21, 1927, p. 8.

William Hoy has been one of the paramount forces in South Africa's advance.[2] In the course of a railway debate, General Smuts said that Sir William Hoy had been a tower of strength, and that his enterprise, enormous efficiency, and driving power had been a tremendous asset to the country. He was pensioned on November 11, 1927, and has been appointed Chairman of the Rhodesian Railway Commission as from 1928.

The capital which has gone into South African railroads in large measure came from exploiting gold and diamond mines.

The railroads and harbors of the Union of South Africa are administered and worked under the control and authority of the Governor General in Council, exercised through the Minister of Railways and Harbors, who is advised by a Board of three Railway Commissioners appointed under the South Africa Act of 1909. These Commissioners are usually political appointees, and are politically minded, with no previous railway experience. One of the most important provisions of the Act governing railway administration prescribes "The railways, ports, and harbors of the Union shall be administered on business principles, due regard being had to agricultural and industrial development within the Union, and promotion by means of cheap transport, of the settlement of an agricultural and industrial population in the inland portions of the provinces of the Union. So far as may be the total earnings shall not be more than sufficient to meet the necessary outlays for working, maintenance, betterment, depreciation, and the payment of interest due on capital not being capital contributed out of railway and harbor revenue." Another important section is: "If the Board shall be required by the Governor General

[2] *Railway Gazette,* November 21, 1927, p. 6.

in Council or under any Act of Parliament or resolution of both Houses of Parliament to provide any services or facilities either gratuitously or at a rate of charge which is insufficient to meet the costs involved in the provision of such services or facilities, the Board shall at the end of each financial year present to Parliament an account approved by the Controller and Auditor General showing as nearly as can be ascertained the amount of the loss incurred by reason of the provision of such services and facilities, and such amount shall be paid out of the Consolidated Revenue Fund to the Railway and Harbor Fund." These two provisions just quoted are intended first, to prevent the railroads being used as an instrument for taxation; second, to mimimize the subordination of railway policy and management to political expediency; third, to limit the scope for drastic changes in railway policy resulting from changes in governments.

The matters on which the Minister is required to consult the Railway Board and obtain its advice are prescribed by law, being generally questions of policy, substantial alterations in tariffs, estimates of revenue and expenditure to be submitted to Parliament, large amounts of expenditure, general alterations in remuneration and working hours of the staff, important changes in organization, investigation of proposed new construction of railroads and the like. The management is subject to the control of the minister, carried out by the general manager, who is governed by regulations framed by the minister after consultation with the board. The working is distributed among the following main departments, the heads of which are all directly responsible to the general manager, Mr. J. R. More, M. I. C. E.:

General Manager's, Transportation, Civil Engineering, Mechanical Engineering, Stores, Accounting, Harbors

and Shipping, Publicity and Bookstalls, Motor Service, Tourist and Travel.

It appears to have been the aim of the general manager to encourage officers of all branches to take a general interest in all the affairs of the service and to collaborate with one another in regard to matters controlled by all. It was considered imperative to get away from the system of water-tight compartments, under which officers only give undivided attention to their own special branch. It is claimed that this policy widens the scope of officers and encourages those who aspire to knowledge outside and beyond their immediate working environment. The increased powers now wielded by the System Managers are evidences of this policy.

Before Union railways and harbors finance was dealt with in the same manner as that of any other department and receipts and revenues were accounted for as part of the general revenue of the several colonies. Under the South Africa Act the Railway Administration controls its own finances through a separate fund known as the Railway and Harbor Fund. It also has its own pension funds for the officers and employees.

Parliament and the Government exercise a general control through various channels, the most important being the annual consideration by Parliament not only in session but by its Select Committee on Railways of the estimates of expenditure both out of revenue and out of loan funds. When Parliament has approved the estimates, an appropriation act is passed, and this is the general authority for the expenditure of the amounts required for railway purposes. Loans required for capital purposes are floated by the central government; that is to say, the assets of the entire Union stand as security back of the bonds authorized. Subject to the special con-

RAILROADS OF THE UNION OF SOUTH AFRICA

For the Year Ending March 31, 1927

Item	State System
Average miles operated	12,897
Capitalization or cost of construction	$623,029,798
Capitalization or cost of construction per mile	50,835
Employees and equipment:	
Number of employees	81,476
Number of locomotives	2,060
Number of passenger cars	3,445
Number of freight cars	35,866
Services:	
Passengers carried—all classes	80,084,249
Passengers carried—first class	28,511,655
Tons of freight carried	23,089,213
Train miles	45,547,644
Locomotive miles	58,161,840
Results of operation:	
Operating revenues	$117,250,273
Operating expenses	94,591,022
Net operating revenue	22,659,251
Operating ratio—per cent	80.67
Charges:	
Passenger revenues	26,346,199
Average receipts per passenger—all classes	0.33
Freight revenue	80,441,639

Source: Report of the General Manager of Railways and Harbors for Year ended March 31, 1927.

ditions arising from government control, the financial transactions of the railway administration have been carried on in practically the same manner as any private business. Surplus moneys available for investment have, under the law, to be handed over to the Public Debt Commissioners for investment. These funds embrace the balances of the renewals fund, betterment fund, and other departmental funds. They also include the balances of various pension funds for which the Administration is the custodian.

Madagascar

In the French possession, Madagascar, there are 430 miles of railroad. Some further railway construction is in

progress. The principal railroad extends 229 miles from Antananarivo to Andevoranto. This road was opened in 1913 and is of meter gauge. The area of the island is 229,000 square miles and the population about three and one-half million.

Réunion

This is also a French possession with an area of only 970 square miles and a population of 200,000. There are 80 miles of railroads. Railway construction was commenced by a private company in 1879 under a guarantee of interest by the French Government. Eighty miles was opened in 1882. Two years later the Government increased the guarantee so as to enable the company to complete port works. These were finished in 1886, but due to lack of sufficient traffic the company became financially embarrassed and the concession was rescinded in 1887. Two years later the railroad and port were transferred to the French Government. Operating results have been unsatisfactory for years. The recent promise of the production of sugar somewhat improves the prospects.

Mauritius

Mauritius is a British possession with an area of 720 square miles and a population of 400,000. It has 120 miles of standard-gauge railroad and 24 miles of two-foot-six-inch gauge serving large sugar interests. The railroad is still under government control.

Rhodesia

There are 2462 miles of line owned by the various railway companies comprised in the Rhodesian system. Of these, 597 miles are worked by the South African Railways Administration; 1252 miles are situated in southern Rhodesia. Of the six companies only one is con-

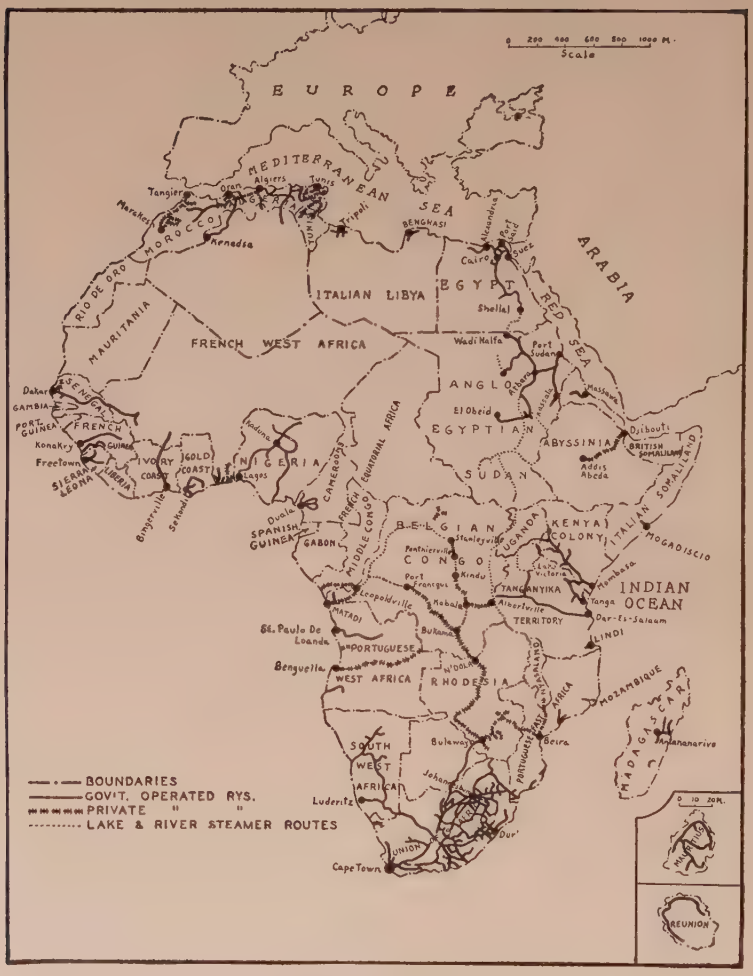
fined to that colony. The gauge is three-feet six inches. The area served is approximately 440,000 square miles. The British South African Company controls most of the mileage which is under coördinated control.

Under recent legislation a railway commission has been set up for the purpose of controlling rates of the system. Under the legislation which has been passed the Commission is charged with seeing that such rates are charged as will suffice to meet all working expenditure and proper fixed charges and to provide in addition a sum to cover a definite contribution for payment of dividends and a sum toward the accumulation of a reserve. Any surplus above these sums is to be devoted to reductions of rates.

The Shire Highlands Railway extends from Blantyre to Port Herald, a distance of 113 miles. This road was constructed by private capital under contract with the Nyasaland Government. It was opened for traffic in 1909. The Government has the right to purchase the road with its equipment at any time after twenty-five years from the date the line was opened; that is, any time after 1934.

The Central African Railway runs from Chindio to Port Herald, where it connects with the Shire Highlands Railway and is 61 miles in length, 45 miles being in Portuguese territory and 16 miles in Nyasaland. The road was opened in 1915. After 99 years from 1912, that part which is in Portuguese territory reverts to the Portuguese Government. At the end of twenty-five years from 1916 the Nyasaland Government has the right to purchase that part of the road in Nyasaland and with the consent of the Portuguese Government it may also purchase the Portuguese section. The Nyasaland Government guaranteed four per cent interest on the preference shares for the ten years ending 1923.

The Trans-Zambesia Railway runs through territory



Railroads of Africa

administered by the Mozambique Company under charter granted by the Portuguese Government. This was transferred to a Belgian company in 1912 and in 1919 to a British company with the consent of both the Portuguese and the Mozambique companies. The Nyasaland

Government guaranteed the interest on the debentures for twenty-five years from date of issue, the company to repay all sums advanced with five per cent interest. The road was opened in 1922 and is 157 miles long. It connects with the system in Rhodesia at Dondo (actually in Portuguese East Africa) and with the Central African by ferry over the Zambesi River. A railway bridge is now being constructed over the Zambesi to eliminate transshipment by ferry.

Tanganyika Territory

The Tanganyika Territory of the East Coast of Africa comprises an area of some 365,000 square miles and has a population of over 4,000,000 people comprised mainly of tribes of mixed Bantu race. The railway system which was taken over from the Germans during the Great War now extends 1000 miles in length with meter gauge. There are two detached railroads running out from the coast; the Central, 772½ miles, and the Tanga, 219 miles. Owing to the deficiency in working capital, the imperial treasury has had to remit certain sums to the territory for the benefit of the railroads, the total being nearly one million pounds. The Nyanza salt works have been operated by a railroad since March, 1925, and have shown considerable profit under this operation. The extension from Taborn to Mwanze, the southern end of Lake Victoria Nyanza, has just been completed.

Kenya and Uganda

The history of the Kenya and Uganda Railway which now comprises 1128 miles of meter-gauge track, is a brief one. The original line called the Uganda Railway, the construction of which was not begun until 1896, was the contribution of Great Britain toward the execution of

her obligations under the General Act of the Brussels Conference of July, 1890, to which all the great powers were parties. The road was opened from the coast to Lake Victoria in 1901. This railroad was built purely for sentimental reasons—that is, with the object of breaking up the slave trade—but has opened up a large area of comparatively unknown territory which has been found to be eminently suitable for European settlement and now constitutes a sound commercial undertaking.

From February 3, 1926, the control, management, and working of all railway, port, harbor, wharf and steamship services have been vested in the High Commissioner for Transport who is the Governor of Kenya, to be administered by him on behalf of both Kenya and Uganda. The High Commissioner is assisted in all matters of policy by a Railway Advisory Council, which is fully representative of Kenya and Uganda. The Council comprises two official and two unofficial members each for Kenya and Uganda with the senior official member for Kenya as Chairman.

Mozambique

The Portuguese possessions in East Africa have an area of 428,000 square miles and comprise the province of Mozambique and other territories. The total population is about 2,600,000. The province of Mozambique is divided into five districts. The Portuguese railways of Mozambique aggregate 180 miles of three-foot-six-inch gauge. In the other Portuguese territory there are three railway lines with a total of 205 miles.

Angola

The province of Angola is another Portuguese possession lying on the West Coast of Africa having a total area

of 485,000 square miles. There are four separate railroads in the colony, one being on three-foot-six-inch gauge, one on meter gauge, and two on 60-centimeter gauge, the total mileage being about 1050. The Loanda State Railway runs from St. Paul de Loanda to Malange on the main plateau, a distance of approximately 375 miles, and affords access to the most fertile regions of the country. The first section, 227 miles, was opened in 1899 by a private company, the second section was opened in 1908 by the Government. The State now operates the whole as a government line.

The Benguella Railway, three-foot-six-inch gauge, starts at Lobito Bay and its objective is to reach the mining region of Katanga in the Belgian Congo. The construction of the line commenced in 1903 and about 500 miles of the 1125 miles have been completed. The concession for building and operating the road is held by the private company.

The south of Angola has been difficult to pacify. The Mossamedes Railway was built 155 miles to the south, one reason for its construction being the facility offered for troop transportation to the foot of the Shella Plateau.

This relatively extended account of the railroads of South Africa has been made by reason of great promise of future development in that region and because government ownership serving a limited white population and millions of natives of low economic value in vast areas appears to have been relatively successful in the Union of South Africa. By reason of the importance of the area and the further development of railroads that will follow in order to serve increasing traffic as well as by reason of the interest that will be taken in the Government's operation of railroads particularly in the Union, some attention should be directed to some special features of

railway progress in South Africa. It should not be overlooked, however, that the mineral development in gold and diamonds was primarily responsible for the construction of branch agricultural feeders. First, mention may be made of the method of dealing with employees. In 1919 it was decided to establish a Board of Reference and Conciliation for railway and harbor servants of the Unino lines. The board comprises five officers including the chairman nominated by the administration and five elected representatives of the staff, one representing the salaried staff and four the other employees. The Conciliation Board deals with all matters referred to it by the Railway Board, the Minister, or the General Manager. It is intended primarily for considering and reporting upon matters involving conditions of service, rates of pay, or principles underlying disciplinary decisions in connection with which differences exist between the Administration and large bodies of employees. Any such question has to be referred to the Board if the Administration is requested to do so by not less than one-fifth of each grade or class of servants affected. Failing such petition, any matter of importance may be referred to the Board at the discretion of the Minister, on request from a staff union. The Board was first introduced as an experimental measure for twelve months, but in pursuance of the wishes of both the administration and the staff, has periodically been reestablished. In 1925 provision was made by Act of Parliament for the establishment of the Conciliation Board, thus conferring upon it legal status. The period of office is now laid down as two years.

Second, attention should be called to the motor-service developments. Despite the huge expenditure for the provision of branch lines to meet agricultural extension in South Africa it has not been possible to keep pace with

insistent demands for additional facilities. In order to meet these demands for transport in sparsely populated areas, the South African Railways Administration has introduced road motor-truck services on an extensive scale and the use of motors as feeders to the railroads is increasing rapidly. The important feature of this new development is that it is unconsciously changing the psychology of farming practice which, generally speaking, was on the usual "annual" crop basis to that of all the year round production yielding a monthly check—a big factor in reducing credit evils and losses on non-paying branch railroads. Many types of motor vehicles are in use, the latest development being the introduction of six-wheel-vehicles with a carrying capacity of 60 cwt. for use on roads over which the ordinary four-wheeled vehicles could not run for a very long time. Sir William Hoy on more than one occasion has expressed his belief that within a comparatively short time motors will operate over as many miles as railroads.[3] To-day over 10,000 route miles are in active operation or have been officially sanctioned.

The third feature of railway progress in South Africa has been the recent establishment of grain elevators. A national service of elevators for the handling of grain in bulk for export and local use was recommended by a committee appointed to consider the question in 1918. It was decided to adopt the system as a state enterprise under the control of the Railways and Harbors Administration. As a result port terminal elevators have been built at Durban and Capetown, together with thirty-three elevators in the Transvaal and Orange Free State, and one in the Cape; the aggregate storage capacity of the thirty-six elevators is 181,200 short tons. Durban can store 42,-

[3] *Railway Gazette,* November 21, 1927, p. 3.

000 tons, and Capetown 30,000 tons, and the thirty-four country elevators have a capacity varying from 1800 tons up to 5800 tons for each elevator.

In the fourth place there are certain special conditions which have contributed to the demand for electrification of railroads. Among these are the difficulties of the narrow gauge, of sharp curves, and of steep gradients and heavy traffic, coal, in one direction. This is particularly true in Natal, the difficulties in the neighborhood of Capetown being somewhat less. In Natal 171 miles have been electrified.

The observation is made [4] that as in all countries where politics and railroads are mixed up there have been difficulties other than technical. The adoption of electrification was not unanimously approved. There have been critics who have complained that the final capital cost exceeded the estimates.

Any observer must conclude that railway development in South Africa has been rather remarkable. It is evident that there could have been no such development without the assistance of the Government. In fact if the Government itself had not entered upon railway construction, there would have been a delay of many years before capital could have been obtained. In order to bind the British Dominions in South Africa into a Union it was apparent that railroads were necessary.

Egypt

Railway construction was commenced in Egypt in 1852. The railroad from Alexandria to Cairo was open about four years later. In 1858 that line was carried east to Suez. By 1874 a road from Cairo extended south to Assiout, 230 miles away. In 1891 the Nile was bridged between

[4] *Railway Gazette, Ibid.*

Assiout and Luxor and in 1898 the road was extended to Luxor, 340 miles south of Cairo. Lord Kitchener had a military narrow-gauge line built from Luxor to Shellal, 140 miles, during the Sudan campaign. This extension was later absorbed by the Egyptian State Railways. The road from Cairo to Suez was replaced by one from Cairo to Ismailia after the opening of the Suez Canal.

The Egyptian State Railway system comprises trunk lines from Alexandria, Port Said, Ismailia, and Suez to Cairo, and from Cairo to Shellal, together with a network of branch and connecting lines chiefly in the Nile Delta; that is to say, north of Cairo. The total length of open lines on the four-foot-eight-and-one-half-inch gauge is approximately 2250 miles of which 410 miles are double track. The State owns and operates a narrow-gauge railroad leading from a station on the main trunk line about 340 miles south of Cairo, to the Oasis of Kharga, a distance of approximately 125 miles.

To enable the interchange of cars and the through billing of goods between Egypt and Palestine, a ferry service has been established at Kantara Station for the conveyance of cars across the Suez Canal. Goods can be put on trucks at any station on the Egyptian State Railways and unloaded at any station on the Palestine Railways.

The general organization of the Egyptian State Railways System which is entirely state owned and government operated follows the departmental scheme; that is, there is a General Manager responsible to Parliament. Then there is a Deputy General Manager and the usual departments such as Engineering, Mechanical, Traffic, Goods, Stores, and Audit, each of which has its own organization and head who is responsible to the General Manager.

The present policy is for the extension and improvement of the state railways. The double track at present ends 150 miles south of Cairo but a further 80 miles of double track has been planned. In the last two years the narrow-gauge line from Luxor to Shellal has been converted to standard gauge lessening the journey from Cairo by four hours. A new bridge to replace the previous structure which had become too light for the increasing axle loads, was built over the Nile at Dessouk and opened to traffic in 1927. During 1927, 25 miles of new line were under construction in the Delta.

In addition to the state railways there are some privately owned lines. The Fayoum Light Railways Company operates in the province of Fayoum and is owned jointly by British and Belgian capitalists. There is no subvention or guarantee from the Government. It is 93 miles long. The Egyptian Delta Light Railways is also privately owned without subvention or guarantee from the State and has 600 miles of line. There are one or two other privately owned short lines.

Turning now to the working results on the government-owned lines it should be said that the Egyptian State Railways are managed as a separate government department on a commercial basis, working on an estimated capital value of L.E. 30,400,000.[1] The following paragraph from the auditor's report on the working for the year 1925-26 is of interest: "It will be appreciated that the earnings of the Egyptian State Railways after deduction of legitimate working expenses, find not only the money for bringing up arrears of renewals, but also the money for additions and improvements usually met from distinct capital provision. In other words, after meeting charges elsewhere funded from revenue reserve and capi-

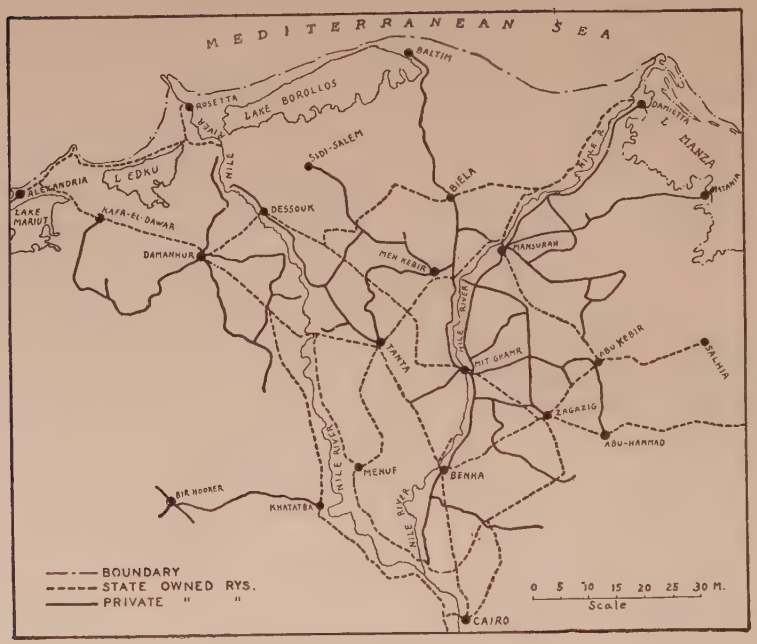
[1] The par value of the Egyptian pound is $4.943.

tal created, the Egyptian State Railways paid over to Government a sum of L.E. 2,119,000 clear of all charge, equivalent to a return of 6.9 per cent on the recorded capital cost of this undertaking."

In the strict sense a capital account does not exist, as the cost originally of lines constructed or acquired by purchase was met from the general revenues and reserves of the State. The provision of working capital to meet cost of extensions, additions, and improvements is by parliamentary grant for specified works as in the case of a department of the Government. Moneys required for working expenses are provided by distinctive parliamentary grants for particular works and services. These grants are not necessarily based on, or made elastic by, the expectation of receipts. The gross receipts are directly credited to the State as a source of revenue and are treated in the state accounts as a matter apart from working expenses. With working expenses and gross receipts so treated, the figure of net receipts is not fairly representative of the results of the railroads over a period of years. There can be no system of financing by the utilization of a reserve because no reserve distinctive to railroads can be created. Consequently as renewals fell badly into arrears during the war period, the whole burden of bringing the line and rolling stock up to standard has fallen on the current periods in which heavy expense has been incurred, and there has been no relief from the surplus earned in war periods, when expenditure on renewals had practically come to a standstill.

Something more should be said of the privately owned Egyptian Delta Light Railways which is a British company organized in 1897. The purpose of the company was to construct light railroads mainly to develop the agricultural traffic in the Egyptian Delta. At present there are

612 miles of line laid to the two-foot-six-inch gauge. There is considerable falling off in revenues as the result of depressed economic conditions prevailing in Egypt since the autumn of 1926 as the result of the fall in the price of cotton. The financial stringency was acute in the agri-



Railroads of the Egyptian Delta

cultural districts, though it was felt throughout the entire country. Passenger receipts were also affected by various reductions in fares that the company has been compelled to make to meet motor competition. The Light Railways Company has 83 locomotives in service and in addition thereto 38 Sentinel steam tractors. The use of these tractors has proven of substantial advantage, as much of the traffic is of a relatively light character and

especially suitable for working by means of such power units. These tractors have been used entirely for passenger traffic and the General Manager reports that but for their introduction passenger traffic would probably have suffered more severely than has been the case. The cost of working per train kilometer was 24 mm. per engine and 12 mm. per tractor. The company owns 342 passenger vehicles and 1400 freight wagons.

RAILROADS OF EGYPT

For the Year Ending March 31, 1927.

Item	State System
Average miles operated	2,302
Capitalization or cost of construction	$151,803,266
Capitalization or cost of construction per mile	65,944
Equipment:	
Number of passenger cars	1,701
Number of freight cars	15,565
Number of locomotives	698
Services:	
Passengers carried—all classes	30,027,701
Tons of freight carried	8,586,695
Train miles	11,947,633
Results of operation:	
Operating revenues	$34,947,407
Operating expenses	25,230,640
Net operating revenue	9,716,767
Operating ratio—per cent	72.20

Source: *Railway Gazette,* Special African Number.

Sudan

The Sudan system of railroads had its beginning in the years 1896 to 1899, when Lord Kitchener constructed 576 miles of military railroad to connect Halfa with Khartoum. This line, instead of following the course of the Nile, cut straight across the Halfa Desert. On the successful termination of the campaign in 1900, the military road and the Egyptian War Department steamers were handed over to the Sudan Government to be adminis-

tered by the Civil Service. At that time the only means of communication with the Sudan was via Egypt, by way of the Egyptian State Railways, terminating at Shellal, and thence by Sudan Government Railway Steamer service to Halfa. In 1905 the Sudan Government Railway was connected with the Red Sea by a line 304 miles long from Atbara to Suakim. Early in 1906 a section 18 miles long

RAILROADS OF SUDAN

For the Year Ending December 31, 1926

Item	State System
Average miles operated	1,728
Equipment:	
Number of locomotives	139
Number of passenger cars	380
Number of freight cars	1,586
Services:	
Passengers carried—all classes	551,408
Tons of freight carried	514,930
Train miles	1,538,725
Results of operation:	
Operating revenues	$7,955,316
Operating expenses	4,750,083
Net operating revenue	3,205,232
Operating ratio—per cent	59.71

Source: *Railway Gazette,* Special African Number.

north to Port Sudan was opened. In 1905 a branch line was thrown out from Abu Hamed to Kareima, a distance of 138 miles, in order to serve the Dongola Province. In 1909 a road reached Wad Medanim, 108 miles south of Khartoum. In 1910 the road was extended to Kosti, 127 miles farther. In 1911 El Obeid, the present terminus, was reached, being a distance of 190 miles from Kosti. In 1914 a short branch line of one and one-half miles was completed in connection with the construction of the Sennar Dam. The outbreak of the World War interrupted further railway development and since the termination of that struggle the only important extension completed

in the Sudan has been the Kassala Railway, 217 miles from Haiya Junction on the Red Sea Line to Kassala.

Nigeria

The first section of the Nigerian Railway consisting of 123 miles was opened in 1901. Since then the system has been increasing fairly steadily and now comprises 1600 miles of line. With the exception of 140 miles of two foot six inch gauge line the system is all three-foot-six-inch gauge. The total capital cost of the Nigerian Railway for the fiscal year 1926-27 was £14,327,000; that is an average of £11,325 per mile. The operating ratio both in 1917 and 1927 was less than 60 per cent and the earnings on the capital investment were 6.83 per cent in 1917 and 6.82 per cent in 1926-27.

Like other railroads in British African possessions the railroad of Nigeria is administered under the control of the Secretary of State for the Colonies through the resident Governor. The management in the Colonies comprises the General Manager and the usual departmental chief officers, the system being operated on a compromise between the departmental and divisional schemes. The transportation scheme of organization was brought into force in February, 1926. The total staff on March 31, 1927, was 15,624, consisting of 425 Europeans, 11,695 Africans and West Indians; or to take another classification 2722 artisans and 10,782 laborers.[1]

Gold Coast

The first section of the Gold Coast Railway was opened to traffic in 1901. The road is of three-foot-six-inch gauge and has 457 miles. The operating ratio is given at 49.5

[1] *Railway Gazette,* Second Special African Number, December 5, 1927, p. 88.

per cent. Like all similar railroads, the administration of the Gold Coast Railway reports through the Governor to the Secretary of State for the Colonies. Its affairs are therefore dealt with directly by the Assistant Secretary responsible for the political affairs of West Africa, who, through the medium of his Chief and the Governor of the Colony, acts as the Chairman of the Board of Directors might do in the case of a privately owned railroad. The actual management of the railway system is vested in a General Manager, who is assisted by the usual departmental officers. In a country such as the Gold Coast the number of officers with administrative rank is necessarily large, due to the need for a goodly proportion being on leave at all times. Owing to the character of the labor the number of men per mile employed on permanent way maintenance is greater than would normally be the case, but it is expected that by improved education it will in due course be possible to bring this down to two men per mile on the heavier lines and that the average length of line supervised by foremen will be approximately 40 miles. The Gold Coast Railway has 85 locomotives, 106 passenger vehicles, and 1032 freight vehicles.[2]

Sierra Leone

The main line of the Sierra Leone Railway runs in an easterly direction from Freetown to Pendembu, a distance of 227½ miles, the terminus being within a comparatively few miles of the frontiers of Liberia and French Guinea. The first survey was authorized by Lord Ripon, the then Secretary of State for the Colonies in 1893. In 1896 the first construction was commenced and in 1899 a section 32 miles long was opened. By 1905, 220 miles had been

[1] *Railway Gazette, ibid.*, p. 194.

completed. Between 1908 and 1910 a branch line 104 miles long was completed from Bauya Junction, 64 miles from Freetown, in a northeasterly direction to Kamabai. In addition to these lines there is a short road five and one-half miles from Freetown to Hill Station on the slopes of the mountains that rise steeply from the coast. This mountain road was opened in 1904 in order to enable European Government officials to live in a more healthful locality. The total mileage of the Sierra Leone Railway is now 338.

During 1926 there was a six weeks' strike of railway employees in Sierra Leone and the general strike and prolonged coal stoppage in England somewhat affected the colony. Yet the operating ratio in 1926 was about 77 per cent. In control and management, this Sierra Leone Railway is a department of the government of the colony. The organization is of the departmental type. The permanent staff employed at the end of 1925 was 2045, of whom 59 were Europeans and 1986 were Africans. The gauge of the road is two feet six inches. It owns 43 locomotives and 85 passenger vehicles.[1]

Morocco

Railway development in Morocco was begun in 1911 when a considerable mileage of two-foot gauge track was hurriedly constructed to assist the advance of a French expeditionary force. Eventually an extensive system of these narrow-gauge lines was planned, one in Eastern Morocco extending from Oudjda to Taza, 210 miles, together with a branch of 82 miles. In Western Morocco lines were completed from Casablanca to some of the more important towns. Several other narrow-gauge lines

[1] *Railway Gazette, Ibid.*, p. 97.

were constructed and a line was extended east to Taza giving through communication from Casablanca to Algeria. This system now comprises 900 miles. The lines were operated by the military forces until 1916, although they began to carry commercial traffic in 1915. In 1916 they were organized as ordinary state railroads. In 1920 the Cheriffian Government took over the working of the lines from the War Department. A syndicate was formed to obtain concessions to build a system of standard-gauge lines. The concessions were handed over to a company called the Moroccan Railways Company which is developing 550 miles of standard-gauge lines. At the end of 1926 several sections had been opened and in 1927 two sections were electrified. The rolling stock of these standard-gauge lines comprises 34 steam and 10 electric locomotives, 10 rail motors, 125 passenger vehicles, and 2000 freight vehicles.

France is the paramount power of Morocco, but the country is divided into three zones: the French Zone, the Spanish Zone, and the International Zone. Under the Franco-Spanish treaty of 1912, the northern portion of Morocco, except for the International Zone, forms the Spanish sphere of influence. According to prewar treaties the Tangier-Fez Railway was the first to be built for commercial purposes, but as a matter of fact, this was not opened for traffic over its whole length until July, 1927. Meanwhile many other lines had been constructed.

That part of the Tangier-Fez line from Fez to Petit Jean was opened in 1924 and trains have been running between Petit Jean and Souk-el-Arba since 1926. The Tangier-Fez line is 200 miles in length, 10 miles of which are in the International Zone, 60 miles in the Spanish Zone, and 130 miles in the French Zone. In 1926 the op-

erating ratio was 84 per cent. The rolling-stock equipment comprises 38 locomotives, 114 passenger cars, and 628 freight vehicles. The line is managed and operated by a Franco-Spanish company which has a monopoly for eighty-five years. In the Spanish Zone of Morocco there are, exclusive of the Tangier-Fez, two short but important railway lines, both of which are operated by the Spanish military authorities. (No data were available on these roads.)

Algeria

The railroads of Algeria comprise 2873 miles, 1540 miles being standard gauge, 920 miles being three-foot-six inch gauge, 278 miles being meter gauge, and 35 miles being two-foot gauge. The Algerian railways essentially comprise an east and west standard-gauge line running parallel to the coast but some distance inland, from the frontier of Tunis through the chief towns of the three departments into Morocco at Oudjda, 10 miles beyond the frontier. A number of branches connect the main line with the various ports while there are three principal penetration lines on the meter gauge running southward into the desert. The state system comprises a large network in the east between the frontier of Tunis and Algiers with a penetration line from Touggourt. The French system in Algeria, The Paris-Lyon-Mediterranean, is 740 miles in length, running from Algiers to Oran and on into Morocco at Oudjda. It has a penetration line from Algiers to Djalfa. In the west there is another state penetration line running from Arzew to Kenadsa. In addition there are several short private lines.

The total rolling stock equipment of the Algerian lines includes 450 locomotives, 460 carriages, and 6315 freight vehicles.

Tunis

The first railroads were built in Tunis between 1876 and 1880 and since then the principal developments have been in connection with branches to the cereal-producing plains in the interior and to deal with the traffic arising from discovery of phosphates in the South. The state system runs a line of 122 miles of standard gauge from Tunis to the Algerian frontier where it connects with the Algerian State Railway. Tunis has a total of 1265 miles of railroad, 317 miles being standard gauge, 948 miles being meter gauge. The railroads are operated by two private companies. The state system of 1000 miles is leased to one company and the remainder of the lines are operated by the Gafsa Company which came into being as a result of the discovery of phosphates in 1885 in the southern part of Tunis. The latter company was formed with the aid of a subsidy of 2,700,000 francs from the Government. The company operating the government-owned lines has 214 locomotives, 5 rail motors, 416 carriages, and 3143 wagons. The Gafsa Company has 83 locomotives, 48 carriages, and 1675 wagons.

Abyssinia

The Franco-Ethiopian Railway is 495 miles long and of meter gauge. It was commenced in 1897 and was opened from Djibouti, at the end of the Red Sea in French Somaliland, to Addis Abeda, the capital of Abyssinia in 1917. The present company was formed in 1908 and the French Government conceded the French section for ninety-nine years with interest guaranteed at 3½ per cent on the capital in addition to interest on the debentures and payments to the sinking fund. Trains are run twice a week in each direction and cover the distance in three days, but

run by day only. There are on the road 39 locomotives, 37 carriages, and 340 freight vehicles.

French Coast of West Africa

French West Africa comprises the colonies of Senegal, French Guinea, the Ivory Coast, Dahomey, Togo, French Sudan, Upper Volta, Mauritania, Nigeria, and the Circle of Dakar and Dependencies. There are a total of about 2100 miles of railroad, all on meter gauge. The first railroads were built to facilitate the military occupation of the areas concerned, but as the countries have been pacified, the lines have been developed and extended. They still partake of the nature of straggling lines running out from suitable coastal points and are in most cases disconnected from each other. However, there are plans for consolidating the systems. The Dakar-St. Louis and the Dahomey Railways are the only ones worked by private concerns. The list of railroads in French West Africa is as follows:

Dakar-St. Louis Railway, 165 miles, opened in 1855. Thies & Kayes Railway, 425 miles, built 1908-1923. Upper Senegal and Niger Railway, 350 miles, 1906. Konakry & Niger Railway, 425 miles, 1910-1914. Ivory Coast Railway, 285 miles, 1912, being extended. Togo Railways, 208 miles 3 branches opened 1905, 1907, 1911. Dahomey Railways, 255 miles, 1912 and 1913.

French Equatorial Africa

The railroads of the ex-German Colony of Cameroons have passed under French control. There are four lines of meter gauge. The northern line is 100 miles long. The other three lines all start from Duala and are respectively 135, 155, and 190 miles in length.

The middle Congo Railway was begun in 1921 from

Pointe Noire to Brazzaville and is 365 miles. In 1912 a two-foot gauge railroad was opened from Minduli to Brazzaville, 100 miles, and it is planned to widen this road. Data on these roads are not available.

Belgian Congo

Rivers form the most extensive means of communication in the Belgian Congo, and the railroads have in the main been built to circumvent unnavigable portions or to form extensions of the river routes. The earliest railroad was the Congo, built 250 miles from Matadi to Leopoldville around rapids in the Congo River. The road which was opened in 1898 was constructed on the two-foot-six-inch gauge, but when the line was relocated in 1920 arrangements were made so that the gauge might be increased to three feet six inches. The road has 146 locomotives, 47 carriages, and 1436 freight vehicles.

From Leopoldville to Port Francqui, river transport is available, and between Port Francqui and Bukama the Bas-Congo & Katanga Railway Company is pushing construction from both ends. It is hoped that the line will be opened within the year 1928. South of Bukama the railroad extends 500 miles to N'dola on the Rhodesian border where it connects with the Rhodesian system. This section was commenced in 1902 from the southern end by the Bas Congo & Katanga Company which is now entrusted not only with the construction but with the operation of the lines of this system. Over half the road was constructed when war broke out and further construction was delayed until Belgium's East African campaign began. Building once more became active and Bukama was reached in 1918. In 1926, 3,123,000 tons of freight, mostly mineral, were carried over the line and the operating ratio was 67.6 per cent.

At the same time that railroads were being constructed from the south to Bukama, there was a movement to reach it by the roundabout northern route of the Congo and Lualaba rivers. The Upper Congo and Great African Lakes Railway Company was incorporated in 1902 for the construction and operation of railroads and steamship lines in the northern part of the Congo. From Leopoldville to Bukama the rivers are navigable with the exception of two series of rapids. The first series necessitated a railroad of 80 miles from Stanleyville to Ponthierville which was completed in 1908. Two years later a further 220 miles of railroad was opened to connect Kindu with Kongolo.[1] This completed the northern through route to Bukama. From Kabolo just south of Kongolo on the steamship route to Bukama, a railroad was built east for 170 miles to reach Lake Albert.[2] From the eastern side of Lake Albert it is possible to reach the coast of Africa over the Tanganyika Railways and in this way connection is afforded between the east and west coasts of the continent.

In 1901 a private company opened the Mayumbe Light Railways from a point just above the mouth of the Congo River for a distance of 85 miles. In 1907 the State took over the road. In the northern part of the colony the Congo Light Railways operate 126 miles of railroad on the two-foot gauge. In 1924 a subsidiary company was organized to operate motor busses on the highways as feeder services to the Congo Light Railways. The motors run over 750 miles of highway. The company operates 65 Minerva three- and four-ton lorries and 36 Ford cars.

[1] Kongolo is near Kabolo.
[2] Albertville is on Lake Albert.

Italian Railways in Africa

There are the following Italian State Railways in operation in Africa: in Libya, 144 miles at Tripoli and 73 miles at Benghasi; in Eritrea a line extends 178 miles inland from Massawa; in Italian Somaliland there are 40 miles built from Mogadiscio.[1]

The train services are of an infrequent character, and generally on the basis of trains three or four times a week. In certain cases motor services have been developed from the railroads to provide passenger transport facilities in neighboring districts. Train speeds are on the low side. A stopping train between Tripoli and Zuara, a distance of 72 miles, is scheduled to take six hours and an express train four hours.

Cape to Cairo Railway

A discussion of the railroads of the continent of Africa would be incomplete without special mention of the effort to get from Cape to Cairo by rail. In 1863 the first section of what was later to be known as the Cape to Cairo Railway was opened from Capetown to Wellington, a distance of 57 miles. This was built with standard gauge and was later reduced to three feet six inches. This line was built by a private company and was acquired by the Cape Government in 1873. Subsequently the road was extended to Worcester, 60 miles further, and by 1885 to Kimberley and in 1890 to Vryburg, 780 miles from Capetown. In 1890 Mr. Rhodes crystallized the idea of north-south railway communication. At that period, following the remarkable gold discoveries of several years before, South Africa was attracting world-wide attention. The enthusiasm of Mr. Rhodes was based on sound business instinct as well as on patriotic aspirations. In 1900 he

[1] The data on these lines were not available.

wrote, "The object is to cut Africa through the center and the railway will pick up trade all along the route. The junctions to the east and west coasts which will occur in the future will be outlets for the traffic obtained along the route of the line as it passes through the center of Africa. At any rate, up to Bulawayo, where I am now, it has been a payable undertaking and I still think it will continue to be so as we advance into the far interior." By 1897 the road was extended through Mafeking to Bulawayo, 1360 miles from Capetown. By 1903 the line was opened to Wanki, 200 miles northwest of Bulawayo. By the following year Victoria Falls, 70 miles from Wanki, was reached. The bridge over the River Zambesi is 420 feet high, being the highest in the world. Rhodesia Broken Hill, which is 2000 miles from Capetown, was reached in 1906. By 1909 the road had been built up to the Belgian border. The railroad now reaches Bukama on the navigable Congo, with the result that to-day one may travel from Capetown by train and river steamer, running in direct connection with the trains, to Stanleyville, on the north side of the Congo State, a distance of 3600 miles, of which three thousand miles is railroad, and to the mouth of the Congo River.

Of the Cape-to-Cairo line there remain one or two comparatively small links and one large one before it is completed. What are termed the small links [1] are along the Congo River where steamers at present fill the gap. Then there is another link, the Wadi Halfa-Assuan break in Egypt. The big link is that between Stanleyville in the Belgian Congo and El Obeid, in the Sudan. This link will presumably run over part of the Darfur Plateau and along the Nile Congo Divide. On the north the Egyptian Railways run from Cairo to Shellal, and are all standard

[1] *Railway Gazette, Ibid.*, p. 100.

gauge. From Shellal to Wadi Halfa there are river steamers which connect with the Sudan Government Railway which extends south to Khartoum, Sennar, and El Obeid.

Alternative routes from Capetown to the north have more than once been suggested. It has been proposed that in the future there will probably be two lines running from Broken Hill in Rhodesia, one going through the Congo Free State to Lake Chad and right through French territory, coming out perhaps at Algiers or some other place on the north coast, the other coming up through German East Africa and ultimately joining up with Khartoum and Cairo. There has been some agitation for a line running from Calais to Capetown which would involve an eight-mile tunnel under the Straits of Gibraltar. The line would run across the Sahara Desert to Nigeria, thence transversing the Congo to the Katanga mining district. The latter suggestion is especially interesting in view of the recent activities in connection with the Trans-Saharan Railway and the introduction of a bill in the French Chamber of Deputies authorizing the Government to provide 18,000,000 francs to defray the cost of carrying out a technical survey and preparing the final plans for the construction of a line across the Sahara Desert. This scheme has been consistently advocated for years.

M. Poincaré has rejected the proposals to insert in the budget of 1928 items looking to furthering the Trans-Saharan Railway project. His rejection has been on the ground of economy. One of the most fervent supporters of the scheme is M. Mahieu, President of the Supreme Railway Council, who declares that technically it presents no insurmountable difficulty, and that financially it does not exceed France's capacity, especially if recourse

is had to German reparations in kind, and economically he believes it must insure rapid development of French Africa. From the point of view of national defense it has an equally ardent advocate in the Supreme Council of National Defense.

CHAPTER XII

INDIA

According to the official report on Indian Railways, India had on March 31, 1926, 38,579 route miles of railroads.[1] Most of the railway mileage is owned by the Government of India and either operated by the Government directly, or operated for the Government by a private company. The Government did not build all the railroads owned by it at present. The earliest railway organizations in India were projected by private associations, and private companies, with very substantial assistance from the Government, were responsible for the original construction on a majority of the roads.

In 1845 two private associations, the East Indian and the Great Indian Peninsula Railway Company, were formed in England to build railroads in India. They found it impossible to raise the necessary funds without the assistance of the Government. The Government of India finally entered into contracts under the provisions of which the Government should provide all the land required for railroads, free, and should guarantee interest at five per cent on the capital, any advances to be repaid by the companies. The Government at its own option might take over the railroads at the end of twenty-five years on fixed terms. By the end of 1852 eight companies

[1] *Report of the Railway Board on Indian Railways*, 1925-26, p. 8.

had been formed to take advantage of these terms and interest had been guaranteed on £52,500,000 sterling as the capital for the construction of five thousand miles of railroad.

The Secretary of State revised the contracts of three important companies in 1869. Under the revised contract the Government extended the existence of the roads another twenty-five years, renounced its claim to arrears due by the companies for the guaranteed interest, and in return received the promise that surplus profits over and above five per cent should be divided equally between the companies and the Government. The Government of India pointed out that since the roads were operating at a loss, it could scarcely be called much of an advantage to be allowed to share in the profits, and that it was highly desirable to acquire the railroads as soon as possible. The protests were quite unavailing.

But the huge losses which the Government was sustaining through the policy of interest guarantees had their effect the same year. Thereafter railroads were to be built by the Government with capital provided from loans and from the surplus revenues of the country. The roads constructed up to this time were on the expensive broad gauge and since the Government had in mind a policy of economy, it decided to adopt the meter gauge, a plan by which it hoped to save money. For a decade, 1870 to 1880, nearly all new construction was carried on by the State with state funds. During the next twelve years, private enterprise again took its place beside state activity.

In 1893 the Government of India was compelled to seek a new expedient. Owing to war, famine, and the fall in the exchange value of the rupee, the Government

found it difficult or impossible to obtain money for railway construction. Furthermore, it would not be caught again in the toils of interest guarantees. Therefore, a plan was devised to encourage individuals and localities to build feeder lines. These "rebate terms," as modified in 1896, provided substantially: free land for right of way; the main line to provide rolling stock; the main line to work the feeders for not more than fifty per cent of the gross earnings of the branch lines.

In addition to commercial lines, the Government of India laid down considerable lengths of railroad which, though they now carry some other traffic, were originally built for strategic and military purposes.

The native Indian States have been rather quick to realize the many advantages of railroads and they have paid for the construction of many miles of line, thereby swelling the total mileage running through their territories. In 1926 there were 4962 miles of line belonging to Indian States.

As the contracts of the old guaranteed lines expired, the Government of India bought in the lines, either working them directly or turning them over to private companies who operated them on behalf of the Government. In recent years there has been a decided movement toward the nationalization of all the railroads of India; that is, a movement toward government operation of government-owned lines. As the contracts with operating companies have one after another expired the Government has not renewed them, but has taken the management into its own hands.

In 1926 there were in India lines worked in almost every combination and degree of state and private ownership. A summary classification follows:

Class		*Miles*
A.	Government lines worked by the Government of India...	13,169
B.	Government lines worked by companies.....	14,095
C.	Company lines subsidized by Government of India.....	2,195
D.	Indian States lines worked by Indian States.....	3,101
E.	Indian State lines worked by main lines.....	1,861
F.	Branch line companies' railroads under guarantee terms worked by branch line companies, or worked by main line; under rebate terms worked by main line; under guarantee and rebate terms.....	2,546
G.	Company lines subsidized by local governments; unassisted company lines; district board lines; company lines subsidized by district boards; lines in foreign territory worked by British Indian Railway companies.....	858
H.	Company lines guaranteed by Indian States.....	754
	Total	38,579

Another classification of railroads divides the mileage according to the gross earnings of the lines. Class I includes the mileage of lines with gross earnings over Rs. 50,00,000 [2] a year. In 1926 there were 34,695 miles of road included. Class II indicates earnings from Rs. 10,-00,000 to Rs. 50,00,000 and includes 2977 miles of narrow-gauge road. Class III contains only 907 miles of road The earnings of these roads fall below Rs. 10,00,000.

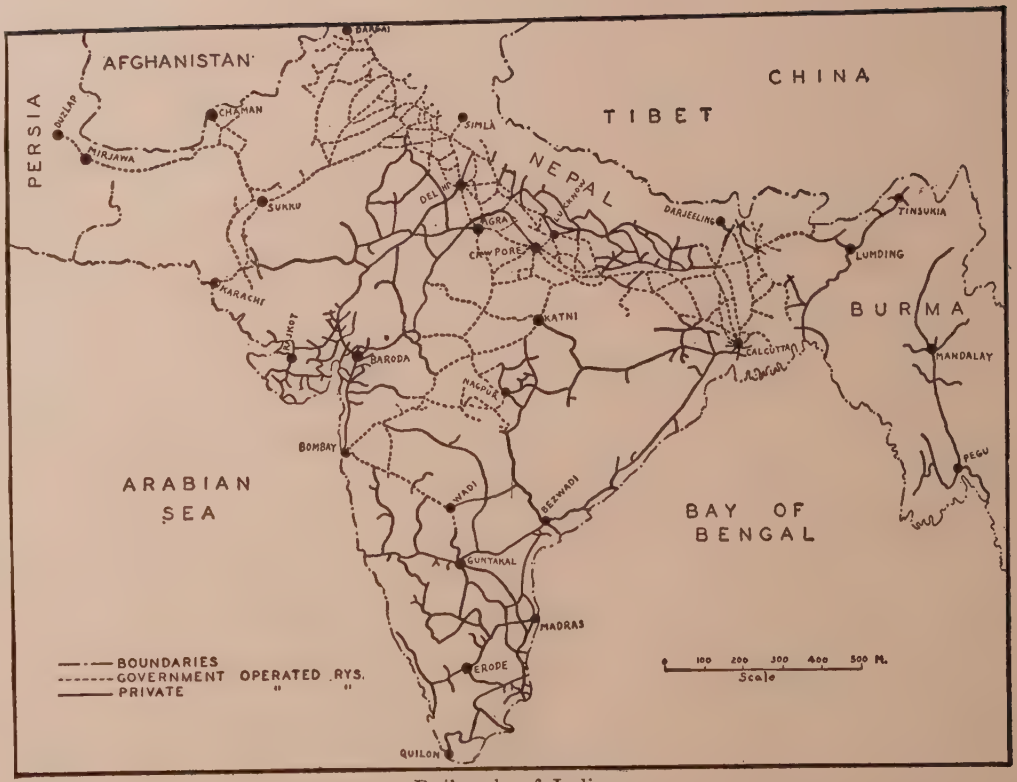
The railroads of India do not form a system or a network. There are many systems, connecting here and there with each other, but terribly hampered by different gauges and unbridged rivers. It might be well to take up these systems separately and indicate their composition.

1. Government lines worked by the Government of India.

a. The Eastern Bengal.

This road was first opened in 1862. In 1884 it was acquired by the Government which amalgamated with it the Northern Bengal State Railway. In 1887 the Government further increased the Eastern Bengal's mileage by amalgamating with it other state roads. In 1913 it was

[2] The present exchange value of the rupee is approximately $0.363.



Railroads of India

said that the railroad consisted of three separate systems cut off from each other by unbridged rivers with shifting banks and channels that were continually altering. Moreover there was a break in gauge at the Ganges River. Since then the sections north and south of the Ganges have been linked by the Hardinge Bridge, but elsewhere transhipment by steamer and flat at each river crossing is necessary. There is hardly a single section of this road which is not liable to damage by flood. In recent years ten-foot floods have covered large areas in Northern Bengal and the inhabitants of many villages have had to take refuge on the railway embankment. The result of floods and earthquakes is that the rivers forsake their courses, die out, or increase in volume and the railroads are subjected to difficulties which can hardly be foreseen.

In 1926 the system was made up of 1604 miles of government-owned road, 73 miles of branch line under rebate terms, and 33 miles of Indian State line, a total of 1710 miles all operated by the Government of India.

b. East Indian Railway.

This company, founded about 1845, opened the first section of its line in the vicinity of Calcutta some five years later with a guarantee from the Honorable East India Company. The experimental part of the first section was finished about 1855 and since the natives did not seem prejudiced against the use of the railroad, the line was extended to Delhi from Calcutta and opened in 1865. In the meantime the Secretary of State for India assumed the liabilities of the Honorable East India Company which ceased to exist. In 1880 the Secretary of State exercised his option of purchase. The road was then leased to a company under a contract, the company receiving a share of the surplus profits. This contract expired Janu-

ary 1, 1925, and the road was transferred to the Government of India for operation. Although in the past capital was raised from time to time by means of debentures, the money so raised was pooled with the other moneys raised by the Secretary of State for public purposes in India and in effect the railroad received its grants for capital expenditure from the Government of India. In 1926 there were 3945 miles of road making up the system. Thirty-two miles were branch lines under rebate terms and 79 miles were leased lines. The remainder were government lines. The standard wagon or freight car now adopted by all Indian railroads has an axle load of sixteen tons as compared with fourteen tons, the previous standard for the East India Railway. This increase of axle load combined with the increasing weight of locomotives, has necessitated an extensive program of renewals of bridges including bridges across the Sone River, one of which is 10,052 feet long.

During the year 1925-1926, the Oudh and Rohilkhand Railway, 1625 miles, was amalgamated with the East Indian Railway. This line has a very heavy passenger traffic, chiefly due to the fondness of the Indians for litigation, and to the large number of pilgrims attending religious fairs or "melas." With regard to the former, the time-tables are, as far as possible, arranged to admit of litigants attending courts and returning to their homes the same day.

c. Great Indian Peninsula Railway.

The Great Indian Peninsula Railway was founded in 1849 and was first opened to traffic in April, 1853. It was company owned until June, 1900, when the Government took it over and paid up the shareholders. After 1900 it was operated by a company for the Government. In recent years there has been some quadrupling of lines to

relieve congestion, the construction of a tunnel to shorten distance, some addition of stations, remodeling and enlargement of old stations, and some suburban electrification. On July 1, 1925, the Great Indian Peninsula Railway was transferred to government management. There were, in 1926, 3670 miles in this system comprising 214 miles of branch lines, 260 miles of Indian State lines, and 3196 miles of government lines.

d. The Northwestern State Railway.

In 1886 the Northwestern State Railway was formed by the amalgamation of three railway systems totaling 1873 miles of line. In 1926 there were 6215 miles of which 4474 miles were government lines; 1287 miles branch lines under rebate terms; 251 miles Indian State lines; and 204 miles, lines subsidized by the Government of India. The railroad operates three ferry services, one of which is owned by the Punjab Government and one by the Army Department. There are certain portions of the Northwestern State Railway which were constructed almost entirely for strategic purposes and from these little or no revenue is obtained. Furthermore, most of the line is single track.

One of the most remarkable engineering projects carried to completion in recent years in India has been the construction of the Khyber Railway. For a thousand years the Khyber Pass has been the gateway through which the invaders of India have found their way. Until a few years ago it was traversed by a moderately good but not very well graded road. The military operations against Afghanistan in 1919 led to the construction of an excellent motor road. When the railroad was projected there was some doubt about the possibility of laying a broad-gauge line up the Pass, but the difficulties were overcome and the 27 miles formally opened on November

2, 1925. There are two and a half miles of tunnels but none exceeds 1400 feet. There are two high viaducts, one eighty feet high, and seven bridges across the Khyber Nala. The line is unique in being situated outside of the administrative border of British India in the strip of territory which separates it from Afghanistan and over which only a limited degree of political control is possible. The road is operated by the Northwestern State Railway.

2. Government lines worked by companies.

a. Assam Bengal.

The construction of this railroad was commenced as a government line in 1891 and one year later the Assam-Bengal Railway Company was formed in England to take over the works commenced by the State. The total mileage in 1926 was 1049, of which 175 miles were branch lines under guarantee and rebate terms. The Government of India guarantees three per cent interest on the share capital of the company.

b. Bengal-Nagpur.

The original line was constructed between 1878 and 1881 as a government project and was managed as such in connection with the Government of the Central Province. In 1887 the Government turned the completed line over to the Bengal-Nagpur Railway Comany, Limited, with a four per cent guarantee on the three million pounds sterling capital. In return the Government was to receive a share of the net profits. Since 1905 the road has yielded a profit to the Government and paid up the advances made by the Government before 1905. The government lines now total 2905 miles and in addition to these the company operates 71 miles of branch line under rebate terms and 24 miles of Indian State line, making a total of 3000 miles. The existing contract between the State and the company does not expire until 1950.

Several of the difficulties which beset Indian railroads may be illustrated by reference to the Bengal-Nagpur road. In 1910 the company began a drive against passenger riding without tickets. The first year six inspectors detected almost ten thousand cases and in 1922 thirty inspectors ejected sixty-eight thousand ticketless riders.

Some of the railroads of India run their own catering departments, others contract with catering houses for this service. Since 1914 the Bengal-Nagpur has operated its own catering department. The whole question of catering is dominated by religious, racial, and caste prejudices which must be taken into account. Separate feeding accommodation must be provided for five classes: first and second-class European and Anglo-Indian; high-class Hindus; lower castes; and Mohammedans. The food requirements of each class are at total variance with each other and food preferences vary from province to province. To illustrate, the inhabitants of Bengal prefer foodstuffs in which sugar predominates, while the people of Madras adhere to curries. The cooking for the different classes has to be done in separate kitchens, the food must be served by different waiters, and the common dining table is unknown.

c. Bombay, Baroda, and Central India.

The Bombay, Baroda, and Central India, a railway system of 3853 miles, was begun in 1855 under contract with the Honorable East India Company, to build from Surat to Baroda. In 1859 contracts were entered into with the Secretary of State for India, providing for the extension of the line to Bombay. The main contract was to run for ninety-nine years from 1855 with the State guaranteeing interest at five per cent on the capital expended on the railroad. The State held an option of purchase at

the end of twenty-five or fifty years, and in 1905 the Secretary of State purchased the road. It was then turned over to a company for operation until 1941. The company works 2937 miles of government line, 329 miles of branch lines under rebate terms, and 566 miles of Indian State lines. The company has been quadrupling and electrifying lines about Bombay in recent years and building a new terminal and shops near there.

d. Burma.

The Burma Railway Company is the largest commercial undertaking in the country of Burma. The government lines, started in 1877, now total 1822 miles. The railroad extends inland for a distance of 725 miles and connects most of the up-country districts with the ports of Rangoon, Moulmein, and Bassein. Except where navigable waterways exist, the railroad is practically the only means of transport between the ports and the inland. The railroads are the property of the Government of India which leases them to the Burma Railway Company, Limited. The construction funds are in part provided by the Government and in part by the company. The Government guarantees two and one-half per cent on the company's share capital of three million pounds sterling and surplus profits are divided with the Government. The Burma railroads suffer from an exceptionally long and heavy rainy season when they run through large areas of deeply flooded country. Material is scarce and costly. Ballast, for example, is very expensive and the soft, saturated banks absorb it continuously. Labor is hard to obtain, expensive and indifferent after it is obtained. During the short working season after the rain, the laborers are enticed away for cutting paddy at rates which the railroads cannot afford to pay. Mechanics and subordinate officers are all imported and require double

the pay in India. Trespassers are a continual source of trouble and expense.

e. Madras and Southern Mahratta.

The present company which now has 3041 miles of line was formed in 1908 to take over several existing roads. Interest in sterling is guaranteed at three and one-half per cent per annum on the nominal capital stock, for the time being, of the company. In common with other Indian railroads, ordinary repairs and renewals on the Madras and Southern Mahratta were reduced to a minimum during the period 1914 to 1919 and important extensions and new works were postponed. During the last five years the Government of India has raised a special loan for railway development of which a substantial allotment was made to this railroad in order that the rolling stock might be replaced with more modern equipment, bridges be renewed, shops enlarged, and stations improved. The system is composed of 51 miles of foreign line, 34 miles of Indian State line, 73 miles of district board line, and 2883 miles of government line.

f. South Indian.

The South Indian Railway has only 1876 miles of single track. Of this 22 miles are foreign line, 161 miles are Indian state lines, 198 are district board lines, and 1495 miles are government lines. The present contract continues until 1945. Passenger receipts slightly exceed the freight revenues due to the large number of people who make pilgrimages to the shrines of southern India throughout the year, especially on the occasion of religious festivals. During the cold months numbers of tourists travel over this line.

3. Private companies subsidized by the Government of India.

a. Bengal and Northwestern Railway Company.

This company was formed in 1882 and the first section was opened within two years. By 1911 there were 1186 miles of line in operation. In 1926 there were 2083 miles including the Tirhut State Railway, 808 miles, which is worked as a part of the system. It is interesting that the state road was built originally as a temporary famine relief line. The system may be purchased by the State in 1932. If not acquired then, it will become the property of the State in 1981 when the Government will merely have to pay for the value of the movable plant, machinery, stores, and rolling stock.

A feature of the Bengal and Northwestern Railway is the steamer service on the Ganges River. Ferries are maintained at four points on this river, three of them making connection with the East Indian Railway. Freight cars are transferred on barges and the transhipment of goods from one gauge to another is made at platforms on the south bank of the river. The largest of these ferries is capable of handling four hundred cars a day in either direction. Navigation on the Ganges is at all time difficult. Since the river has no clearly defined banks and is constantly changing its course, the problem of maintaining freight yards at places accessible to steamers is one which demands great vigilance and considerable forethought. The difference between high level during rains and low level during the dry season is over thirty feet. At many intervening stages during the rise and fall, special lines have to be run out over sand banks and temporary station yards have to be laid in order to keep the connections open. Pilots are constantly employed taking soundings and examining the various channels so that a fresh station may be constructed before the existing one becomes unworkable.

The Bengal and Northwestern Railway and its allied

lines, the Rohilkund and Kumaon, are especially interesting as being the most important examples of railroads in India which, though subsidized, were not financed by the Government. The Bengal and Northwestern received only land from the Government. They have also always been noted for economical management and low operating ratio.

b. Rohilkund and Kumaon Railway.

The Rohilkund and Kumaon Railway system is situated in the United Provinces. The original line of 54 miles was opened in 1884. At present the system consists of 259 miles of road subsidized by the Government of India and 312 miles of Government line. Most of the railroad is single track. The Government may terminate the contracts in 1932 by giving twelve months' notice, and purchase the various portions of the system collectively, but not singly.

4. Indian State lines worked by Indian companies.

a. Jodhpur.

Until November, 1924, the railroads owned by the Durbars of Jodhpur and Bikaner were operated together by the Jodhpur-Bikaner Railway Administration. His Highness the Maharajah of Bikaner decided to terminate the arrangement so that each State should be able to develop its own system and the dissolution has been carried out in a friendly spirit. The Jodhpur system now operates 643 miles of Indian State lines, 124 miles of Government line, and 100 miles of line subsidized by the Indian Government.

b. Nizam's Guaranteed State Railways.

His Highness the Nizam's Guaranteed State Railway Company operates 716 miles of line belonging to the Indian State, 253 miles guaranteed by the Indian State, and 21 miles of government line.

Although the Indian railroads form one of the greatest state-owned systems in the world it is somewhat difficult to prove very much in regard to the relative efficiency of state and company operated roads. The operation of company lines is so hedged about by government rules and restrictions that there is little opportunity for original developments. The Indian Government in some ways watches more closely over the details on company operated lines than some European Governments do over their own state lines.

As this survey shows, the railway policy of the Government of India has varied from time to time. The Government has been guided by the desire to develop the country and to avoid too great a burden on the taxpayers. The fact that the Government has made itself liable to be called on to give financial assistance to or to buy out any railroad which might not prove a success has had a rather steadying effect on the Government's railway policy. On the other hand, the Acworth Committee made a very severe indictment of the railway policy in India. It was pointed out that the operating ratios were inordinately high, that a country such as India with its teeming millions and its boundless resources should be able to support and better support a much greater mileage of railroads than has been provided.

For the present, India seems definitely committed to direct government management. Although there has been an attempt to impress the members of the Legislative Assembly with the apparent success of private management of Indian railroads under government control, most of the native members remain firm in their stand for nationalization. Some of the natives who confess doubt as to the possibility of running the railroads as

efficiently as is now done, state that they place nationalization before all other considerations. Some of them argue that the larger the mileage operated by the Government directly, the greater the opportunity for increasing the Indian personnel, for raising wages, improving conditions of employees, and of generally pleasing that part of the electorate.

Although India does not have representative government, and for that reason the employees may not directly bring as much pressure to bear on governmental authorities as in other countries, the pressure of native opinion already causes more natives to be employed as officials on the government lines than would be the case were efficiency the sole consideration, and more than the companies find desirable.[3] As an example, out of consideration of safety all third-class passengers were formerly locked in waiting rooms as on the continent of Europe to prevent their attempting to board trains before they stop. Now some of the state lines have been compelled to discontinue this practice as humiliating to the native. Another consideration which makes the English members of the Assembly look unfavorably on government management is that putting aside all thought of race prejudice, it is unfortunately true that the efforts to turn the young native into a competent and trustworthy engineer or traffic man have to a large extent been a failure.

The English members of the Legislative Assembly at Delhi who had particularly hoped that India would not become definitely committed to a policy of nationalizing her railroads were somewhat disappointed by the decision of the Government to terminate the contracts of the East Indian and Great Indian Peninsula Railways

[3] *Railway Gazette,* Special Indian Number, May 28, 1923, p. 1.

and to operate those lines as government roads. It was observed that in nearly every country where the railroads have been nationalized there has resulted a constant struggle to find some means of preventing the interference of the politician with the management. So far no country has found a solution of this difficulty. Apart altogether from the question of direct corruption the average member of any democratic assembly, however honest personally, is constantly finding himself pressed to vote in connection with railway matters in the interest of his own constituents or of one class of the community rather than in the interests of the railroads and the State as a whole; to support new lines and new trains which he knows are not justified. In short, politicians as a body are constantly being forced to do things opposed to efficiency on state railroads.

The scheme which seems to have commended itself most highly to the Legislative Assembly is one of territorial grouping. It was believed that the roads were too extensive to be managed from Delhi and that decentralization would result in great economies. The real difficulty in arranging any immediate comprehensive scheme for India seems to lie in the fact that, although broadly speaking, the majority of the railroads are owned by the State, some of them are managed directly by the State, while others are leased for definite terms of years to companies. The difficulty in question is a very real one, as will be seen when the expiration dates of the contracts with certain chief existing companies are considered. The contract of the Bengal and Northwestern expires in 1932, that of the Bombay, Baroda, and Central Indian in 1941, the South Indian Railway Company's in 1945, and that of the Bengal-Nagpur Railway Company not until 1950.

Although the final territorial grouping of the Indian railroads seems to be far distant, there have been important changes taking place in the railway organization. During the year 1923-1924 the Legislative Assembly agreed that from 1922 to 1927 a definite sum for capital expenditure on rehabilitation should be guaranteed. The railroads at last were able to formulate development programs with the assurance that they would be able to carry them out in their entirety. In November, 1922, the Acworth Committee's recommendation of a Chief Commissioner was carried out. A year later the Chief Commissioner's proposals for complete reorganization of the railway department were approved in modified form and went into effect in April, 1924. The new organization has been designed with the object of fitting the department for the work of administering the railroads as a commercial concern and is based on the principle of giving it such a measure of independence in its management of railway problems as is compatible with its position as a department of the Government. In the meantime, the divisional scheme of organization was introduced on the Great Indian Peninsula Railway with unqualified success, according to the 1923-1924 report on Indian Railways.

During the year 1925-1926, there were important changes made in the management of some of the roads and certain sections of line were transferred from one company to another. The Great Indian Peninsula and the East Indian Railways came under government management. The Oudh and Rohilkhand Railway was amalgamated with the East Indian. Three sections of the East Indian were transferred, two to the Northwestern Railway and one to the Great Indian Peninsula Railway. As one result of these territorial adjustments, the number

of junctions where two or more government managed railway administrations meet has been reduced from eighteen to seven. Each of the government managed systems now serves a well-defined geographical area, and certain advantages in working have been obtained from the fact that former competitive routes are now controlled by one administration in each area.

A bolder policy of new construction is being adopted by the Railway Board in consequence of the improved financial position of the railroads resulting from the separation of the railway account from the general finances of the country. The total mileage of projects which the Railway Board had either sanctioned or were having investigated by the end of March, 1926, amounted to between six and seven thousand miles, and it is hoped that when all arrangements in this direction are in full swing the total yearly addition to the mileage of Indian railroads will be approximately a thousand miles. During 1925-1926, 341 miles of road were opened to traffic and in 1926-1927, 421 miles. During 1927-1928 as much as 2250 miles were under construction and 600 miles more had been sanctioned. The biggest program of expansion at present is in Burma where construction will be commenced on 650 miles of new line of a total of 1600 miles contemplated.

Under the agreement separating the railway revenues from the general finances of the country, the general revenues receive an annual contribution from the railroads which shall be the first charge on the net receipts on the railroads. For the fiscal year ending March 31, 1926, $18,000,000 was paid into the general revenues by the government-owned railroads under this plan.

Before leaving the survey of Indian lines, at least two of the current difficulties that beset the management

should be mentioned. Following the War the question of thefts caused much anxiety to directors and managers in England and throughout Europe. In India this seems to be a permanent problem. Not only do portable articles,

RAILROADS OF INDIA

For the Year Ending March 31, 1926

Item	All Railroads
Average miles operated	38,579
Capitalization or cost of construction	$2,446,998,509
Capitalization or cost of construction per mile	63,428
Employees and equipment:	
Number of employees	741,860
Number of locomotives	10,024
Number of passenger cars	26,005
Number of freight cars	226,766
Services:	
Passengers carried—all classes	599,034,800
Passengers carried—first class	1,031,900
Tons of freight carried	89,171,040
Tons of freight carried one mile	22,286,744,480
Train miles	162,278,000
Locomotive miles	210,844,000
Results of operation:	
Operating revenues	$367,843,972
Operating expenses	230,617,582
Net operating revenue	137,226,390
Operating ratio—per cent	62.69
Charges:	
Passenger revenues	128,004,996
Average receipts per passenger—all classes	0.21
Average receipts per passenger—first class	3.79
Average receipts per passenger mile—all classes	0.630¢
Average receipts per passenger mile—first class	3.515¢
Freight revenue	208,950,257
Average receipts per ton mile	0.937¢

Source: Report by the Railway Board on Indian Railways for 1925-1926.

such as glasses, soap, and towels, soon disappear from the carriages, but the leather straps in the windows and even the bronze and gun-metal coat hooks seldom last long. In consequence a different method of raising windows has had to be adopted, while the plainest iron

fittings are being used in many of the newer carriages. Theft from cars in transit is a constant trouble.

Some criticism was aroused in India by the reference in the Acworth report to the question of payments which have too often to be made by shippers to station masters before they can get an adequate supply of cars. As a matter of fact it appears to be very difficult to impress upon the delinquent the gravity of this offense. Competent station masters have the attitude that tips should be received. It is part of a custom, and the fact that a station master doubles or trebles his wages in this way is not regarded with disapproval so much as with envy by his neighbors.

CHAPTER XIII

AUSTRALIA AND CANADA

AUSTRALIA AND NEW ZEALAND

In Australia the railroads with minor exceptions belong to the different State Governments. The public sentiment that railroads ought to be public property is to-day so strong that it is impossible to imagine any serious development of privately owned lines. At the beginning of railway history in Australia there seems to have been a preference for private enterprise. But capital was not available for railway construction for the reason that it was absorbed in the development of the gold fields. It came down to a point that, if railroads were to be built at all, public credit would have to be pledged in order to obtain English capital. It was these considerations that caused the State to go into the railway business. Since then private capital has not been anxious to enter Australian railroads. Moreover, the state roads have apparently been jealous of interference by private companies. Again, state socialism has been carried further in Australia than in any other English-speaking country. In order for readers in the United States to get some idea of conditions in Australia a comparison may be made between an Australian State and a State of the American Union. For this purpose we had best compare New South Wales with Texas.[1]

[1] William M. Acworth, "Historical Sketch of Government Ownership of Railroads in Foreign Countries," pp. 35-36.

New South Wales has 310,372 square miles and Texas 265,896 square miles. New South Wales has a population of about 2,300,000 as against a Texas population of 5,220,000. The rate of increase of population is probably a little more rapid in Texas. New South Wales has in

Railroads of Australia

Sydney a city of more than a million people while Texas probably has no city with as many as 250,000, though there are four each approaching 200,000. New South Wales has about one-third as much railway mileage as the State of Texas where we find over 16,000 miles. New South Wales has a mile of railroad for every 404 people and in Texas there is a mile of railroad for about every 314 inhabitants. In New South Wales the rate per ton

mile is 2.716 cents, in Texas it is 1.424 cents. The average ton haul in New South Wales is about 98 miles as against 136 in Texas. Texas railroads have better gradi-

RAILROADS OF NEW SOUTH WALES
For the Year Ending June 30, 1927

Item	State System
Average miles operated	5,747
Capitalization or cost of construction	$548,888,394
Capitalization or cost of construction per mile	95,456
Employees and equipment:	
Number of employees	45,265
Number of locomotives	1,420
Number of passenger cars	2,338
Number of freight cars	23,889
Services:	
Passengers carried—all classes	141,615,806
Passengers carried—first class	17,307,282
Tons of freight carried	18,887,753
Tons of freight carried one mile	1,853,392,396
Train miles	26,325,847
Locomotive miles	34,875,288
Results of operation:	
Operating revenues	$92,008,692
Operating expenses	67,137,519
Net operating revenue	24,871,173
Operating ratio—per cent	72.97
Charges:	
Passenger revenues	32,329,800
Average receipts per passenger—all classes	0.23
Average receipts per passenger—first class	0.62
Average receipts per passenger mile—all classes	1.831¢
Freight revenue	51,052,471
Average receipts per ton mile	2.716¢

Source: Report of the Railway Commissioners for the year ending June 30, 1927.

ents and longer hauls, but these do not explain the difference in rates, rates being so much higher in New South Wales than in Texas. New South Wales has always been able to raise all the capital it needed on government credit at the lowest rates, while Texas railroads have had to get their capital as best they could. Private

railroads of Texas are certainly giving the people of that State more ample, more efficient, and much less expensive service than the Government of New South Wales

RAILROADS OF VICTORIA

For the Year Ending June 30, 1927

Item	State System
Average miles operated	4,627
Capitalization or cost of construction	$344,164,369
Capitalization or cost of construction per mile	74,268
Employees and equipment:	
Number of employees	29,595
Number of locomotives	687
Number of passenger cars	2,004
Number of freight cars	20,842
Services:	
Passengers carried—all classes	169,237,648
Passengers carried—first class	72,189,475
Tons of freight carried	10,343,114
Tons of freight carried one mile	988,868,598
Train miles	18,030,749
Locomotive miles	22,627,812
Results of operation:	
Operating revenues	$66,439,570
Operating expenses	49,395,700
Net operating revenue	17,043,870
Operating ratio—per cent	74.35
Charges:	
Passenger revenues	27,452,082
Average receipts per passenger—all classes	0.16
Average receipts per passenger mile—all classes	1.860¢
Freight revenue	30,873,543
Average receipts per ton mile	3.114¢

Source: Report of the Victorian Railways Commissioners for the year ending June 30, 1927.

furnishes its citizens. It is difficult to find out just what the ton-mileage statistics in Australia are. Only two of the seven state railway systems publish such statistics and they show ton-mile charges about three times as high as in the United States.

Until 1884 the railroads of the different colonies were

run by ministers responsible to Parliament. The system was not a success from the financial or any other point of view.[2] Victoria led the way in appointing a commission removed from politics. However, the experiment was not successful and the railroads were handed back to direct political control.

Acworth says that "evidently a commission, which, though composed of individuals personally clean-handed, is not strong enough to crush attempts at jobbery in its neighborhood, may be even worse for the public interest than a Minister who uses his patronage for political ends. For the Minister can at least be watched and exposed in Parliament by political opponents, while a Commission can take shelter under the cloak of its statutory irresponsibility." In New South Wales the Chief Commissioner was a man of iron will and a brilliant administrator. Under him the roads prospered and no charges could be sustained against him. After his death things went wrong and in a few years two of the three Commissioners were called upon to retire after an investigation by a Royal Commission. After the railway strike in Victoria, which was put down by threat of a drastic Bill introduced in Parliament, the public-service employees of the State were practically deprived of their vote.

For thirty years most of the Australian States have imported their chief official, whether entitled Commissioner or General Manager, from England. What shall be said of an organization which cannot train its own young men to become chief executives? Is not the reason that, in a commercial concern, promotion by merit not only brings the best men to the top, but stimulates every man to do his best, while government service usually

[2] Acworth, *ibid.*, p. 55.

only get work done at the rate of what is known in England as "government stroke."

Under government ownership and operation in Australia some railroads have been constructed because some

RAILROADS OF AUSTRALIA
For the Year Ending June 30, 1927

Item	Commonwealth System
Average miles operated	1,733
Capitalization or cost of construction	$59,871,552
Capitalization or cost of construction per mile	34,547
Employees and equipment:	
Number of employees	1,248
Number of locomotives	102
Number of passenger cars	73
Number of freight cars	1,354
Services:	
Passengers carried—all classes	221,384
Passengers carried—first class	37,840
Tons of freight carried	251,567
Tons of freight carried one mile	29,320,408
Train miles	832,661
Locomotive miles	1,040,276
Results of operation:	
Operating revenues	$2,426,962
Operating expenses	2,294,530
Net operating revenue	132,432
Operating ratio—per cent	94.54
Charges:	
Passenger revenues	794,281
Average receipts per passenger—all classes	3.59
Average receipts per passenger mile—all classes	2.352¢
Freight revenue	993,301
Average receipts per ton mile	3.386¢

Source: Report on Commonwealth Railways Operations for the year ending June 30, 1927.

member for the interested district was pertinacious and insistent, not because the lines were needed. Redundant officials by the hundred have been employed or retained in office for the same reason.[3]

[3] Acworth, "Railways under Government Control," *Forum,* Vol. II, p. 81.

Different colonies have appointed non-political boards of railway commissioners, holding office for life, to manage their railroads. But it has been impossible to withdraw from the Government and Parliament the power

RAILROADS OF QUEENSLAND

For the Year Ending June 30, 1927

Item	State System
Average miles operated	6,260
Capitalization or cost of construction	$277,860,623
Capitalization or cost of construction per mile	44,090
Employees and equipment:	
Number of employees	20,138
Number of locomotives	761
Number of passenger cars	1,068
Number of freight cars	18,801
Services:	
Passengers carried—all classes	26,812,993
Passengers carried—first class	3,671,824
Tons of freight carried	4,833,375
Train miles	11,905,663
Locomotive miles	16,510,285
Results of operation:	
Operating revenues	$35,650,407
Operating expenses	31,609,485
Net operating revenue	4,040,922
Operating ratio—per cent	88.67
Charges:	
Passenger revenues	9,806,878
Average receipts per passenger—all classes	0.37
Average receipts per passenger—first class	0.98
Freight revenue	22,527,530

Source: Report of the Commissioner for Railways for the year ending June 30, 1927.

of the purse and the decision as to construction of new lines. Rates have not come down as they have in America and the country does not show the same rate of development.

The Commonwealth of Australia has an area of 2,975,000 square miles and a total population of about 6,000,000. The mileage operated by the Commonwealth

at the end of the fiscal year, June 30, 1926, was 1733. The operating ratio for that year was 126.4 .

In New South Wales the average miles operated at

RAILROADS OF SOUTH AUSTRALIA
For the Year Ending June 30, 1927

Item	State System
Average miles operated	2,523
Capitalization or cost of construction	$139,682,999
Capitalization or cost of construction per mile	55,259
Employees and equipment:	
Number of employees	10,802
Number of locomotives	489
Number of passenger cars	744
Number of freight cars	9,343
Services:	
Passengers carried—all classes	25,984,940
Passengers carried—first class	2,352,397
Tons of freight carried	4,129,205
Tons of freight carried one mile	436,399,345
Train miles	6,497,207
Locomotive miles	9,095,400
Results of operation:	
Operating revenues	$20,168,781
Operating expenses	28,674,528
Net operating revenue	Def. 8,505,747
Operating ratio—per cent	142.17
Charges:	
Passenger revenues	5,207,072
Average receipts per passenger—all classes	0.20
Average receipts per passenger—first class	0.66
Average receipts per passenger mile—all classes	1.747¢
Freight revenue	13,009,872
Average receipts per ton mile	2.987¢

Source: Reports of the Railways Commissioner for the year 1926-1927.

the end of the fiscal year, June 30, 1926, was 5722 and the operating ratio was 73.

In Queensland 6145 miles were operated, the operating ratio being 86.8.

In South Australia that year there were 2490 miles of railroad, the operating ratio being 166.66.

West Australia has 3837 miles of road which were also operated with a ratio of 75 per cent.

New Zealand with an area of 103,000 square miles and a population of 1,500,000 has 3150 miles of railroad, of

RAILROADS OF WESTERN AUSTRALIA

For the Year Ending June 30, 1927

Item	State System
Average miles operated	3,906
Capitalization or cost of construction	$104,952,214
Capitalization or cost of construction per mile	26,868
Employees and equipment:	
Number of employees	8,827
Number of locomotives	396
Number of passenger cars	479
Number of freight cars	10,517
Services:	
Passengers carried—all classes	15,737,570
Passengers carried—first class	2,527,785
Tons of freight carried	3,851,217
Tons of freight carried one mile	355,985,869
Train miles	5,481,480
Locomotive miles	7,023,667
Results of operation:	
Operating revenues	$17,558,278
Operating expenses	13,069,925
Net operating revenue	4,488,353
Operating ratio—per cent	74.44
Charges:	
Passenger revenues	3,870,250
Average receipts per passenger—all classes	0.25
Average receipts per passenger—first class	0.55
Freight revenue	11,747,011
Average receipts per ton mile	3.295¢

Source: Report of the Working of the Government Railways, Tramways, etc., for the year ending June 30, 1927.

three-foot-six-inch gauge, which were operated in 1926 at the ratio of 81 per cent.

The railroads of Tasmania are owned and operated by the colony.

Great extent of territory and relatively small population make it more difficult to operate railroads in

Australia as profitably as in some other countries. The railway net is built ahead of the traffic and with political clamor for additional railroads that situation will doubtless be continued for many years.

With the exception of the transcontinental line, the

RAILROADS OF NEW ZEALAND
For the Year Ending March 31, 1927

Item	State System
Average miles operated	3,157
Capitalization or cost of construction	$239,353,527
Capitalization or cost of construction per mile	75,650
Employees and equipment:	
Number of employees	18,458
Number of locomotives	698
Number of passenger cars	1,610
Number of freight cars	26,513
Services:	
Passengers carried—all classes	26,002,137
Tons of freight carried	8,175,722
Tons of freight carried one mile	509,458,356
Train miles	10,723,864
Locomotive miles	15,212,086
Results of operation:	
Operating revenues	$36,126,326
Operating expenses	29,969,284
Net operating revenue	6,157,042
Operating ratio—per cent	82.96
Charges:	
Passenger revenues	11,235,960
Average receipts per passenger—all classes	0.43
Freight revenue	22,571,207
Average receipts per ton mile	4.417¢

Source: Railways statement, 1927.

north-south line to Alice Springs, and an isolated railroad in the tropical northern territory, owned and operated by the Federal Government, the railway mileage lying within the borders of each of the six Australian States is owned and operated by the State concerned. The management is by a board of three commissioners in

New South Wales and in Victoria and by one commissioner in each of the other States. A Commissioner administers the Federal railroads. Coördination between the separate railway systems is in some measure secured

RAILROADS OF TASMANIA
For the Year Ending June 30, 1925

Item	State System
Average miles operated	673
Capitalization or cost of construction	$31,224,408
Capitalization or cost of construction per mile	46,402
Employees and equipment:	
Number of employees	1,466
Number of locomotives	96
Number of passenger cars	234
Number of freight cars	1,870
Services:	
Passengers carried—all classes	2,656,018
Tons of freight carried	773,428
Tons of freight carried one mile	33,260,640
Train miles	1,380,405
Locomotive miles	1,674,342
Results of operation:	
Operating revenues	$2,668,088
Operating expenses	2,586,983
Net operating revenue	81,105
Operating ratio—per cent	96.96
Charges:	
Passenger revenues	913,447
Average receipts per passenger—all classes	0.34
Average receipts per passenger mile—all classes	2.007¢
Freight revenue	1,421,037
Average receipts per ton mile	4.273¢

Source: Summary of Australian Statistics of Transport and Communications.

by means of annual conferences attended by the principal administrative officers and the Commissioners of all systems, including New Zealand.

The Victorian railroads have entered into active competition with motor services on the highways, which affect rail traffic. The policy is not only to operate high-

way busses as supplementary to the railroad, but to carry people entirely by highway when they prefer such service. The South Australian Railways are also engaged in furnishing motor service on the highways for passenger, freight, parcels, and luggage. The passenger service includes double deck busses for short distances and parlor coaches for the longer distances.

RAILROADS OF AUSTRALIA

For the Year Ending June 30, 1925

Item	State Systems
Average miles operated	24,624
Capitalization or cost of construction	$1,343,712,893
Capitalization or cost of construction per mile	54,086
Employees and equipment:	
Number of employees	114,181
Number of locomotives	3,891
Number of passenger cars	7,120
Number of freight cars	83,875
Services:	
Passengers carried—all classes	370,346,170
Tons of freight carried	42,543,189
Train miles	71,774,087
Locomotive miles	88,468,779
Results of operation:	
Operating revenues	$218,834,164
Operating expenses	161,149,685
Net operating revenue	57,684,479
Operating ratio—per cent	73.64
Charges:	
Passenger revenues	77,170,436
Average receipts per passenger—all classes	0.21
Freight revenue	119,367,493

Source: Summary of Australian Statistics of Transport and Communications.

A new transcontinental line is being built across Australia north and south. It has been completed to Alice Springs. Evidently this is a railroad constructed for political reasons, and not because prospective traffic justifies the enterprise.

CANADA

There are at the present time two important railway systems in Canada, the Canadian Pacific system and the Canadian National. The Canadian Pacific has 14,004 miles of road, the Canadian National 22,682 miles. The Canadian Pacific always has been and still is privately owned and operated. The National system is owned and operated by the Government. Not that government ownership of railroads has ever been an avowed policy of the Canadian Government; the railroads which it has were thrust upon it by unforeseen circumstances. The first road constructed by the State, the Intercolonial, was undertaken solely as an integral part of the bargain of confederation and the Government was assumed to have ended its railway enterprises with the building of the Prince Edward Island narrow-gauge line in 1873. There was no attempt at government monopoly in the territory adjacent to the Intercolonial. Lines to act as feeders to the main line were built by private enterprise. But when the short lines did not prove to be as profitable as it was hoped, the Government, urged by public opinion, slowly acquired some five hundred miles of these lines and consolidated them with the Intercolonial.[1]

Although government ownership of railroads was not the policy of the country, government aid in construction seems to have been accepted without pause. At the end of 1912 Canada had 26,727 miles of railroad. About two thousand miles was the property of the Government. Between 1876 and 1912 there were 21,509 miles of railroad constructed. The Dominion, the provinces, and the municipalities aided the private lines to the extent of

[1] L. Payne, *Railway Age*, Vol. 66, p. 33.

$208,000,000 in cash and 56,000,000 acres of land, besides guaranteeing $245,070,045 of railway bonds.[2]

The main lines, other than the Intercolonial, were the Grand Trunk, the Canadian Northern, and the Canadian Pacific. The Canadian Pacific was a transcontinental line, well situated, well managed, and profitable. The Grand Trunk, which was the first important road in Canada, had a good system of lines and facilities in the older part of the Dominion, Ontario and Quebec, and some useful subsidiaries in the United States. But up to 1902 it had no means of tapping the traffic of the prairie provinces. On the other hand the Canadian Northern, with the help of provincial guarantees, had secured an important network of lines in the three prairie provinces and was a successful company with access to the chief centers of traffic. But its prosperity kindled its desire to expand both east and west.

The Prime Minister brought the heads of the Grand Trunk and the Canadian Northern together, hoping they might unite, one with eastern lines and one with western and avoid the construction of a new line. The negotiations came to naught and both companies undertook their own extensions.

Composed of a number of companies, the Canadian Northern system was loosely held together by stock ownership. The entire issue of common stock was held by Messrs. Mackenzie and Mann, promoters of the company. When the company determined on building a transcontinental line, it raised large amounts of capital in London by the issue, on its own credit, of perpetual debenture stock and convertible income debenture stock. In 1913 the Federal Government granted to the company a subsidy to aid its scheme. The next year, however, the com-

[2] Canada Railway Statistics, year ended June 30, 1912.

pany found itself without funds to complete its line and its stations, to provide necessary equipment, or to pay its interest charges. It appealed to the Government, which responded by guaranteeing an issue of $45,000,000 of four per cent first mortgage bonds. In return the Government received $40,000,000 of the $100,000,000 of common stock of the company and was given the right to appoint one director. In spite of this help from the Government the company's position remained very uncertain. The company had gone ahead too fast, had undertaken expensive schemes that could not carry themselves from the outset, and the old western lines were not furnishing sufficient surplus to carry the extensions during the period of construction. Furthermore, due to the outbreak of the War, there was a stringency in the money market.

In 1916 the Canadian Northern had an uncompleted line in British Columbia and Ontario, and the Montreal Terminal involved a serious commitment. The previous year the company had been forced to call upon the Government for money to pay the interest on the $45,000,000 of debentures. In 1916 with the money markets of the world practically closed to the issue of permanent securities other than government loans, the Canadian Northern obtained from the Government a loan of $15,000,000 at six per cent to be used for construction or payment of interest.

In the meantime the Grand Trunk and the Government had come to an agreement over the construction of the Grand Trunk's transcontinental line. In conference between the company and the Government, arrangements were completed, with the unwilling assent of the former for the new line from Moncton, New Brunswick, to Prince Rupert on the Pacific coast. Of this through

route the Dominion Government was to construct the eastern division from Moncton to Winnipeg, to be known as the National Transcontinental Railway. The Grand Trunk, through a new company, the Grand Trunk Pacific, was to construct the remainder of the line, with large governmental assistance, and was to operate the National Transcontinental at a rental of three per cent of the cost of construction. But when the cost of the National Transcontinental was more than double the estimate, the Grand Trunk Pacific Company refused to take over the road; and by accepting the refusal and beginning to operate the line itself, the Government in effect released the Grand Trunk Pacific from its obligations and added the National Transcontinental to the other government railroads.

The Grand Trunk Pacific itself had experienced difficulties of construction and operation. Prices and wages were higher than anticipated. The road was built for heavy traffic so that it would not have to be changed in later years when traffic increased, but at this time the road had few feeders or branches and ran through a sparsely populated country. In all the main centers it met the competition of the Canadian Pacific and the Canadian Northern which were operating at a profit and which were in a position to render better service.

By December, 1918, the Grand Trunk's commitment for the Grand Trunk Pacific and its subsidiaries was over $123,000,000. The Dominion had guaranteed interest on nearly $77,000,000 and the provinces on almost $17,000,000. The Dominion had made loans to the company of $25,000,000. Yet during 1917, 1918, and 1919 the Grand Trunk Pacific with an operating ratio of about 105 per cent earned less than its working expenses. The

parent company was unable to meet the deficits of the Grand Trunk Pacific and the Government set aside $8,000,000 in the estimates for the Grand Trunk Pacific account for 1916 and $7,500,000 for 1917 and 1918.

The Canadian Northern, the Grand Trunk, and affiliated companies were on the verge of bankruptcy. A Royal Commission was appointed to investigate the situation and in 1917 it made its report. Its conclusions and recommendations may be summarized as follows: [3]

1. The mileage of Canadian railroads is very great in proportion to the population of the country. It is greater than is commercially justifiable as shown by the low net return. Due to the natural waterways the railroads are less necessary than in other countries.

2. The public investment in railroads is very large. The total amount of public capital involved in direct construction of government lines, and cash aid, land grants and guarantees to private companies, is nearly a billion dollars, not counting the value of lands still unsold. Of this nearly $700,000,000 went to the principal private companies. Public aid amounts to two-thirds of the total investment of the Grand Trunk Pacific and to three-fourths of the Canadian Northern. A guarantee policy is dangerous and its wisdom questionable.

3. The Grand Trunk and the Canadian Northern should have been amalgamated and the construction of a third transcontinental line avoided.

4. The interest charges on the Grand Trunk Pacific system amount to over $8,800,000 per annum and the net income last year was $826,653. The Grand Trunk Company's liability for interest amounts to over five mil-

[3] Report of the Royal Commission to inquire into Railways and Transportation in Canada, Ottawa, 1917.

lion dollars at present and will rise to over seven million in 1923. We cannot recommend that the Grand Trunk Company be unconditionally released from their liability. The Government has voluntarily relieved them of all responsibility for the National Transcontinental. In respect to the Grand Trunk Pacific the Government is fully entitled, morally as well as legally, to call upon the Grand Trunk Company to fulfill its contract.

5. The Grand Trunk Company has made unjustifiable charges to capital, it has not spent $21,000,000 on maintenance that should have been spent, and $30,000,000 of new capital expenditure is needed to give the country adequate service.

6. We recommend that the control of both the Grand Trunk Pacific and the Grand Trunk be assumed by the people of Canada on terms hereafter set out.

7. The Canadian Northern has been financed mainly by the issue of guaranteed securities on which it paid the interest until 1914. Since then the Government has had to bear the burden and apparently must continue to bear it. The company will require seventy million dollars of new capital within five years and we do not recommend that further public aid be given to the Canadian Northern as at present constituted. The Canadian Northern common stock represents no cash investment, and has no present value, either on the basis of the cost of reproduction of the property or on the basis of its earning power. We recommend that the public take control of the Canadian Northern Company on terms hereafter set out.

8. On the assumption that the people of Canada take control of the Grand Trunk, Grand Trunk Pacific, and Canadian Northern, we consider possible methods of management and operation.

a. Government operation:

(1) We do not consider that operation by a minister directly responsible to Parliament would be in the public interest. It would not secure better service or lower rates.

(2) If the Government operated these three railroads, it would be bound in fairness to the Canadian Pacific shareholders to take over their railroad also. The Canadian Pacific gives good service and should not be interfered with.

(3) Special objections to direct government ownership and operation are:

(a) That Canadian railroads operate more than seven thousand miles of line subject to the foreign jurisdiction of the United States;

(b) That the Canadian Government resources are required for war purposes.

(4) We therefore reject the idea of direct government ownership and operation.

b. We do not recommend that the Grand Trunk, Grand Trunk Pacific, and Canadian Northern Companies be allowed to go into the hands of a receiver.

c. We recommend that the control of these three companies be transferred to a new body.

(1) We have discussed and rejected the following suggestions:

(a) Transfer of all three railroads to the Canadian Pacific;

(b) Transfer of the Canadian Northern or a portion of the Canadian Northern to the Canadian Pacific.

(2) There is no possibility of forming a new commercial company to take over the three railroads. Neither the Mexican precedent, under which the Government becomes a majority shareholder, nor the New York sub-

way precedent, under which the public authority shares the profits with the private shareholder, is applicable to this case.

(3) We recommend that a new public authority, a Board of Trustees, be incorporated by Act of Parliament as the "Dominion Railway Company"; and that the Canadian Northern, Grand Trunk, and Grand Trunk Pacific be transferred to this body.

9. We recommend that the Government assume responsibility to the Dominion Railway Company for the interest on the existing securities of the transferred companies; that the Intercolonial and National Transcontinental be also transferred to the Dominion Railway Company; that the whole of the Dominion Railways be operated by the Trustees as one united system, on a commercial basis under their own politically undisturbed management, on account of, and for the benefit of, the people of Canada.

10. We lay stress on the importance of the Board being non-political, permanent, and self-perpetuating.

There follow recommendations as to the setting up and operation of this new Board and as to the settlements that should be made with the shareholders of the companies.

In writing of this report later, Mr. Acworth, who was one of the three members of the Commission, said that previously he had submitted to a Committee of both Houses of the Congress of the United States, who were investigating government ownership, an historical sketch of government ownership of railroads in foreign countries. Although in it he had not attempted to suppress his own reading of the facts, that in a democratic state

the balance of argument is against government ownership, yet when he was appointed on the Royal Commission to study the problem of transportation in Canada he recommended a form of government ownership. "With the strongest prepossession against the course which we ultimately recommended, my colleague and I—for the third member, the Chairman of the Commission, dissented—came to the conclusion that the facts and figures of the case proved that two great railroad companies, controlling some 15,000 miles of line between them, were unable to maintain an independent existence, and that their undertakings must be transferred to the Government, which alone could carry the burden."

After the Report of the Royal Commission was made, a bill was introduced in Parliament by the Minister of Finance providing for the acquisition of the Canadian Northern, but leaving the other lines in statu quo. By reason of the guarantees of bonds by the provinces and the Dominion, and the fact that the governments were being called upon to a large extent to make good these guarantees, Parliament considered that the taking over of the Canadian Northern was practically compulsory. There are many details of this whole transaction which have never been made public; but it is stated that certain financial interests which had made large loans to the Canadian Northern Railway Company would have lost heavily had the Government not taken over the road. Public judgment on the vast changes was neither specifically sought nor positively declared. The matter in any of its aspects was not an issue before the people. Furthermore, one would search the records of Parliament and the Canadian newspapers in vain to find anything which could be fairly recognized as a general discussion of the

policy of government ownership as against the policy of private ownership.[4]

Although the majority report of the Railway Inquiry Commission had said that the stockholders of the Canadian Northern had no equity in the property, the Minister of Finance stated that there were certain assets which had not been accounted for in the report, and in bringing in a bill for taking over the Canadian Northern, the Government proposed not to acquire the property of the company but to buy the remainder of the company's common stock amounting nominally to $60,000,000. The value of the stock was to be determined by a board of arbitration, but the bill placed a limit of $10,000,000 on the value. The board set the value at $10,800,000 without stating its reasons. The system passed into the hands of the Government on October 1, 1917. The former operating staff was maintained, but a new board of directors was appointed by the Government. For operating purposes the Intercolonial, the National Transcontinental, and the Grand Trunk Pacific, after it went into the hands of a receiver in March, 1919, were added to the Canadian Northern.

In 1919 a deficit of $48,000,000 resulted from the operation by the Government of this new combination of roads. In 1920 the deficit was $70,000,000. This does not include interest on the capital of the Intercolonial and National Transcontinental. The explanations which were offered in connection with this deficit were:

1. High wages due to the "McAdoo" and "Chicago" awards in the United States which had raised wages eighty-eight per cent in two years;

2. High cost of fuel and other materials;

[4] J. L. Payne, *Railway Age*, Vol. 66, p. 33.

3. Charges to operating expenses and not to capital account of a large amount of deferred maintenance.

In 1919 the Grand Trunk Pacific went into the hands of a receiver. A year later an agreement was reached for the acquisition of the Grand Trunk Pacific and the Grand Trunk. The Grand Trunk claimed that in return for its handing over to the Government the $25,000,000 of Grand Trunk Pacific common stock, for which the Grand Trunk had paid but a nominal amount of cash, the Government should not only relieve the Grand Trunk of all liability for the Grand Trunk Pacific but should pay back to the Grand Trunk any money it had advanced to the Grand Trunk Pacific and its subsidiaries. This claim was based on the alleged breaking of faith by the Government when it granted assistance to the Canadian Northern, a competitor of the Grand Trunk and Grand Trunk Pacific, to construct its transcontinental line. The conclusion of nonpartisan examiners was that the company had no claim against the Government.

The agreement of 1920 provided: that the Government should acquire the common and preference stock of the Grand Trunk railway system; that the value, if any, to the holders thereof should be determined by a board of three arbitrators; that the value should not exceed $64,166,666; that the present stock should be exchanged for new non-voting stock to the amount of the value, if any, so determined; that the Government would guarantee four per cent return on the new stock; and that nominees of the Government should be appointed in place of the former boards of directors and officers.

On September 7, 1921, the board of arbitration made its award and the majority held that the preference and common stocks had no value, for the company's books were unreliable; dividends had been paid when the

money should have been spent on maintenance and improvements; there was a huge debt owing to the Government for construction funds, etc.; the company had no net earnings but rather a deficit on which the value of the stock might be based. Mr. Taft, now Chief Justice of the United States Supreme Court, dissented, and stated the value in his opinion to be not less than forty-eight million dollars. His contention was that the stock had potential value and that the replacement values of the physical assets should have been considered. The Privy Council in London upheld the majority of the board.

However erroneous the reasons may have been, and whatever may have been the lack of comprehension even on the part of the Government of the full significance of the consummation of the transaction, the ostensible reasons for the taking over of the Grand Trunk system were:

1. The companies were in such financial difficulties that they could not surmount them alone and the Government was determined to give no more money to private railroads.

2. If the companies were allowed to go into insolvency and be operated under a receivership, it would be injurious to the credit of Canada, since the Government had assisted these roads to such a large extent. It was necessary to save the credit of the country.

3. The companies were taken over on the assumption that the people wanted government ownership. In reality, this issue had never been put before the people, although there were certain newspapers which were clamoring for it.

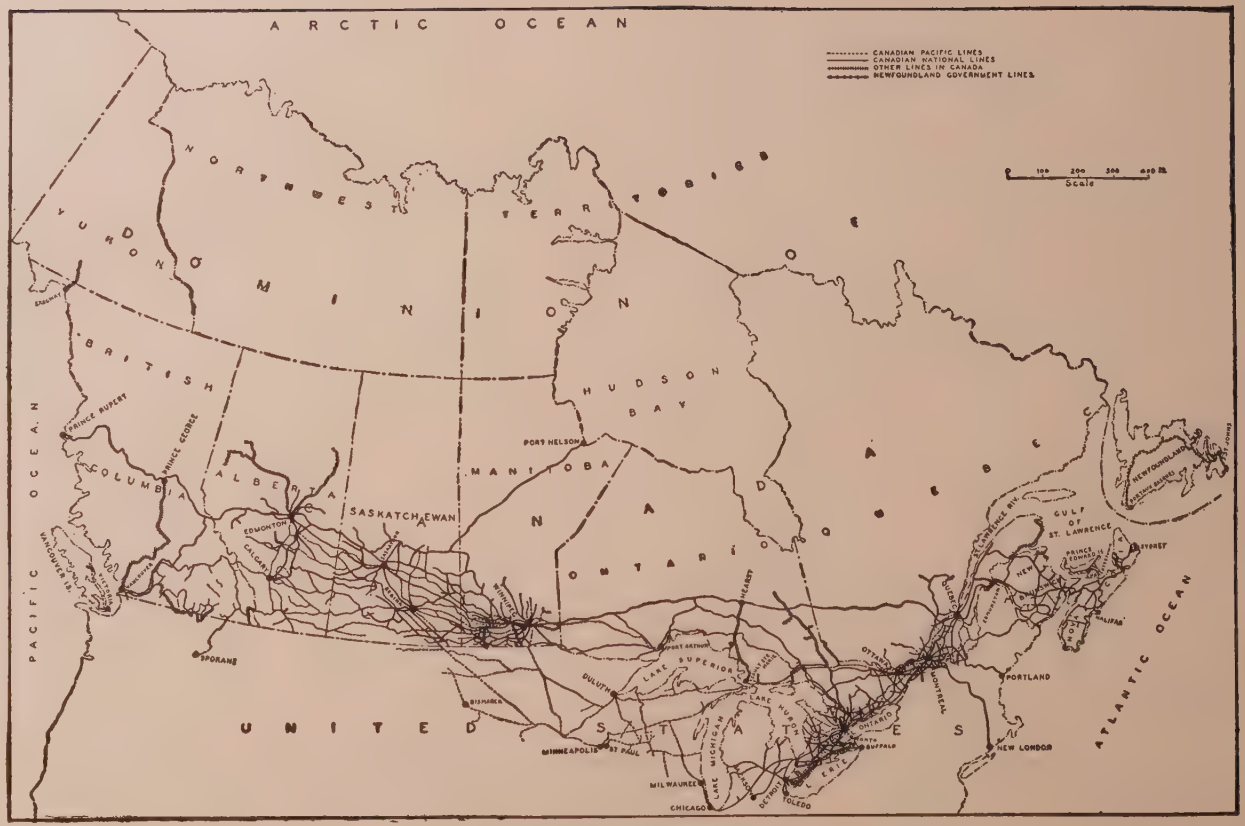
4. It was said that the Grand Trunk and Grand Trunk Pacific were essential to round out the government sys-

tem of railroads so that it might be able to compete with the Canadian Pacific Railway; in other words, that the Grand Trunk which had a good network of lines in all the important centers in the East and which could be a great source of traffic and of strength was necessary as the eastern connection of a system which otherwise would have insufficient access to the best paying traffic of the country.

The Grand Trunk was taken over in May, 1921. In October, 1922, Sir Henry Thornton was appointed president of the Canadian National Railways and chairman of the new board of directors. The Committee of Management of the Grand Trunk and the Board of Management of the Canadian Northern resigned and the new board assumed control of the combined properties with 22,000 miles of line. In January, 1923, the Government gave its authority for the amalgamation of the Grand Trunk and Canadian National Railways into one company under the latter name. The operating organization was divided into three districts, eastern, middle, and western, with the officials of each division entrusted with as much authority as is consistent with centralized administration.

"Although much was said as to the economies which would be possible when these railways were brought together under one management, it was unreasonable to expect that deficit-bearing roads, when combined, would prove to be profit producers. When railways are complementary much may be accomplished by combined operation; but when, as in this case, the roads were competitive and not designed to work together, there were narrow limitations of the economies of combined operation."[5]

[5] W. T. Jackman, "Economics of Transportation," p. 700.



Railroads of Canada

It is not hard to understand why the Canadian National Railway system might be unprofitable, if the difficulties in the way of its success are remembered.

1. The Canadian Northern had been taken over because it could not earn enough to pay operating expenses and fixed charges.

2. The Grand Trunk Pacific could not pay operating expenses and both these roads needed new equipment.

3. The National Transcontinental had operating deficits due to insufficient traffic.

4. The Intercolonial had never been able to do more than pay operating expenses.

5. These railroads were not built for a system.

6. They were badly located for securing traffic except the Canadian Northern.

7. Their service was inferior to the Canadian Pacific and traffic went to the latter.

8. The Canadian Pacific could concentrate its freight into heavy trainloads and economize—the National could not.

9. In the National system, there was duplication of lines with inadequate traffic.

10. There was very little coördination among the staffs of the various divisions and there was an entire lack of *esprit de corps* among the segregated groups of men.

11. Both directors and managers complained of the public indifference towards the national lines.[6]

Moreover the Government did not make a thorough investigation of the condition and value of the roadway, real estate, equipment, or rolling stock of the roads. It did not investigate the extent of the liability of the country in connection with the obligations of the roads. It was thus unable to have a clear indication of the

[6] W. T. Jackman, "Economics of Transportation," p. 698.

amounts which would have to be spent in improving the property to bring it up to the proper operating standard.

The results of operation as shown by official statistics indicate that the net operating deficit of 1921 was transformed into a net operating surplus for 1922 and for each year thereafter. This showing is due to the method of accounting. There has been a deficit each year after fixed charges have been accounted for. The deficit would show to be larger if the accounts of the government railroads included interest upon the investment in the original government lines—the Intercolonial, the Prince Edward Island, and the National Transcontinental. There are many men of wide experience in railroads and finance who are dubious as to the possibility of this road, which has so many obstacles in the way of economical operation, being able to show good results for a long time.

The present situation is that Canada has two comprehensive and competitive systems of railroads. There is not enough traffic at present to make both systems reasonably prosperous. There will be a strong temptation on the part of the Government to depress rates to draw traffic from the privately owned Canadian Pacific. The Government could charge any deficit from such a policy to the taxpayers. The result would be the ultimate bankruptcy of the Canadian Pacific lines and the acquisition of them by the Government. If the Government treats the Canadian Pacific with fairness, and maintains reasonable and equitable rates on both systems, the Canadian Pacific will continue to meet its obligations, both systems will render good service, and when the development of the country catches up with railway construction, deficits should unquestionably disappear on the National lines, and then the Canadian people should

exercise their choice between retaining the National lines under government operation or turning them back to private companies.

Gross earnings of the Canadian National for the first ten months of 1927 totaled $219,708,000, compared with $216,712,000 for the same period in 1926. Operating expenses for the first ten months of 1927 were $186,367,000 as against $179,568,000 for the same period in 1926. The Canadian Pacific had an increase of $1,657,000 in gross earnings and $6,788,000 in operating expenses for that period.[7] In 1926 the Canadian lines carried the heaviest traffic of their history. 1927 was another good year. The decrease in net operating revenues was due to an increase in wages accompanied by decreases in freight rates. The freight rates were lowered by order of Parliament. The rates in the Maritime provinces were lowered, but Parliament agreed to make good any resulting deficits to the Maritime lines. The losses to the revenues of the railroads came in decreased rates made to apply over a wide territory in the West.

In response to an inquiry made by the Senate, the Interstate Commerce Commission in May, 1928, reported that rates on grain are higher from points in the Northwestern states to the seaboard than from corresponding points in the Canadian provinces. The explanation was that these rate differences to the Atlantic ports appear to be due directly, and to the Pacific ports indirectly, to certain charter provisions of the Canadian Pacific Railway. That railway was in 1897 granted a charter to build a line from Lethbridge, Canada, through the Crowsnest Pass into British Columbia, and was given a subsidy of $3,500,000 and a land grant. In return it agreed, among other concessions, to reduce the then existing rates from

[7] Lyne, James G., *Railway Age*, January 7, 1928, p. 34.

the western Canadian provinces to Lake Superior ports by 3 cents per 100 pounds, and to maintain such reduced rates in perpetuity unless otherwise authorized by the Canadian Government. Commodity price and freight rate levels both in Canada and the United States, speaking generally, are to-day much higher than those which prevailed at the time of the Crowsnest Pass agreement.

During the years 1919-1923, the Canadian Government permitted the application of grain rates higher than those provided in the Crowsnest Pass agreement, but in the latter year it required restoration of the former rates, and the latter are still in effect. Consequently the grain rates from points in western Canada on the Canadian Pacific to ports on Lake Superior are generally on a lower basis than other rates.

Using these rates of the Canadian Pacific as a basis, the authorities of Canada have in recent years required the establishment of similar rates also from points on the Canadian National Railway and from branch line points on the Canadian Pacific not in existence in 1897 to Lake Superior ports, and from points on both lines to British Columbia on Puget Sound.

In addition to the subsidy, the Canadian Pacific also received at the time of its construction a loan of $25,000,000 from the Government, perpetual exemption from taxation, and 25,000,000 acres of land.

Another factor in the situation is that all the weak or less prosperous railroads are now operated through the Canadian National Railways by the Dominion Government, which bears the burden of all deficiency in return.

The Canadian Pacific is thus in a position to charge lower rates than would be possible if rates were made in Canada as they are in this country, with a view to providing a fair return upon the aggregate value of all rail-

way property, including the weak lines as well as the strong.

While it is conceded that Canadian railroads have been built far ahead of the traffic, three hundred miles of new line were constructed in 1926, and in 1927 several hundred miles were under construction. It is expected that the Hudson Bay Railway will be completed to Fort Churchill on Hudson Bay by the latter part of 1929.

RAILROADS OF CANADA

For the Year Ending December 31, 1926

Item	Canadian Pacific System	Canadian National System	All Railroads
Average miles operated	13,863	20,796	40,352
Capitalization or cost of construction	$731,641,861	$2,446,438,781	$3,560,948,932
Capitalization or cost of construction per mile	52,777	117,640	88,247
Employees and equipment:			
Number of employees	60,215	88,849	174,266
Number of locomotives	2,255	2,670	5,679
Number of passenger cars	2,824	3,358	6,848
Number of freight cars	90,881	109,574	221,255
Services:			
Passengers carried	13,505,863	20,589,208	42,686,166
Tons of freight carried	34,336,191	48,164,331	105,221,906
Tons of freight carried one mile	13,842,580,786	16,629,018,817	34,153,466,033
Train miles	46,228,788	52,101,611	113,538,876
Locomotive miles	60,122,111	71,264,295	151,273,283
Results of operation:			
Operating revenues	$197,636,215	$225,547,852	$493,599,754
Operating expenses	149,713,398	190,173,271	389,503,453
Net operating revenue	47,922,817	35,374,581	104,096,301
Operating ratio—per cent	75.75	84.32	78.91
Charges:			
Passenger revenues	33,974,589	34,688,266	81,164,676
Average receipts per passenger	2.52	1.68	1.90
Average receipts per passenger mile	2.708¢	2.609¢	2.706¢
Freight revenue	139,602,333	165,766,866	356,321,965
Average receipts per ton mile	1.008¢	0.997¢	1.043¢
Taxes	5,722,083	3,474,287	10,783,788

Source: Statistics of Steam Railways of Canada, Dominion Bureau of Statistics.

NEWFOUNDLAND

Newfoundland has a total area of 42,734 square miles, approximately that of the State of Virginia. Practically

the entire terrain is a region of lakes and streams; the land area is less than two-thirds of the total. According to the census of 1921 the population numbered 259,259.

Newfoundland is the oldest of Britain's colonial possessions, and since 1855 it has had a degree of self-government equivalent to that enjoyed by Canada, Australia, New Zealand, and South Africa. It is thus a separate, self-governing dominion of the British Commonwealth of Nations.[1]

Practically all the railroads of Newfoundland were built by the late Sir Robert G. Reid and the Reid Newfoundland Company. Until 1923 they were also operated by the Reid interests. Prior to the Reid connection with Newfoundland in 1890, two railway projects had been initiated and about ninety miles of line had been completed. In 1890 the Government decided to proceed with the construction of the line to Hall's Bay and let a contract to the late Sir Robert to complete the line. Three years later the route of the line was changed and a contract signed under which the railroad was to be completed within three years for $15,600 a mile, payable in Newfoundland bonds. Under this contract the trans-insular line and some branch lines were completed and opened for traffic in 1898, giving the island a total of 638 miles of railroad.

The second construction contract was entered into between the Newfoundland Government and the Reid Newfoundland Company in 1909 and ratified by the Legislature in 1910. Under this the Government undertook to provide $6,000,000 for the construction of about 400 miles of branch lines. In 1913, $2,000,000 additional was provided for the completion of the branches, and 263

[1] U. S. Department of Commerce, "Newfoundland," Lynn W. Meekins, 1926.

miles had been placed in operation and about 120 miles were partially completed when construction was abandoned at the outbreak of the War in 1914.

The first operating contract is dated September 1, 1893, and under it Mr. Reid undertook to construct a telegraph system and to operate it as well as the railroad for ten years at his own expense, in consideration of a grant in fee simple of 5000 acres of land per mile of railroad built. The financial disaster of 1894 brought about such a condition of affairs in the island, that when the line was completed in 1898 a new operating contract was made. Under this contract, which was the subject of bitter controversy, Mr. Reid undertook to operate the lines for fifty years without cost to the Government on the expiration of which period the property of the railroad was to become vested in him; to build seven steamships and operate them on specified routes, and to pay the Government within a year $1,000,000; the Government to hand over the telegraph system; to sell the dry dock at a fixed price, and to grant an additional 2,500,000 acres of land in fee simple. Mr. Reid also undertook to build an electric railway and do certain paving work in St. John's. Controversy continued to be waged over this contract and in 1900 the Government which had agreed to it was defeated.

The new Government was approached by Mr. Reid with a view to the creation of the Reid Newfoundland Company to take over his interests, but consent was refused until modification of the 1898 contract was made. An amending agreement was approved by the Legislature in 1901 and authority was given for the formation of the Reid Newfoundland Company. Under the new contract Mr. Reid made some concessions in regard to the lands granted, agreed that the railroad should revert

to the Government at the end of the fifty-year contract, when the million dollars paid in cash under the 1898 contract would be repaid with interest, and that the value of improvements made to the railroad during the currency of the lease should be determined by arbitration. He also agreed to hand back the telegraph lines to the Government. In 1910 the operating contract was supplemented by a contract bringing 400 miles of branch lines under the main line terms, the company to receive 4000 acres a mile in respect thereof.[2]

For the ten years before the War the average income of the railroad was $650,000, but the average loss was $100,000. The railroad had not been a paying proposition from the first. With the outbreak of the War the railway situation became complicated and while traffic fell off, the cost of coal, labor, and other supplies increased enormously, reconditioning of the line proved difficult, locomotives and cars could not be procured. The annual loss increased to $350,000 for the year ending June 30, 1918, and was greater in 1919, although the income had increased to $1,250,000 a year. At the same time rolling stock fell into disrepair and accidents increased so that public confidence was shaken in the road as a means of safe travel.[3]

Some of the conditions under which the railroad was and is operated should be pointed out. Nearly 1000 miles of line have been built to serve a population of 250,000, a large proportion of whom live beyond its reach, and the balance live at points directly accessible to water transportation. The main industry of the colony is fishing, and as practically the entire population lives at tidewater there is very little traffic which could not move

[2] *Canadian Railway and Marine World,* May, 1922, p. 223.
[3] *Ibid.,* December, 1920, p. 667.

by water, and a great proportion does so. There are, so far, no producing mines to furnish a large and continuous tonnage for the railroad, and the existing pulp and paper mills are so located on excellent natural harbors that with water transportation admittedly cheaper than rail transportation it is not to be expected that rail traffic will greatly increase. The volume of traffic is also adversely affected by unnecessary and unfair competition fostered by government subsidies.[4]

The line is of narrow gauge, gradients are excessive, and rails and bridges are light so that it has never been possible to get an average trainload much over one-tenth that obtaining on Canadian roads. In 1920-1921 it cost the Newfoundland railroad seven and one-half cents to carry one ton of freight one mile, while it cost other companies less than one cent. The revenue per ton mile for 1920-1921 was two and one-half cents representing one-third of the cost of operation. One of the most oppressive burdens which has been borne by the railroad has been the operation of unremunerative branches, which appear to have been built without any reliable estimates as to their traffic possibilities, or if estimated a gross error was made in assuming that they would produce sufficient revenue to make them self-sustaining. In general it is a fact that the more business the railroad handled the greater the loss involved. From the beginning the road operated on too low freight rates. In 1898 the rates were supposed to be based on the existing Canadian rates, but from 1898 to 1918 the basis of rates averaged eleven per cent lower than the Canadian rates of 1898. From time to time the Canadian railroads were granted increases and while in 1922 the Canadian National Railways had local mileage rates forty-eight per cent higher

[4] See map of Canada, p. 284.

than the Newfoundland Railway, the Canadian National Railways were not earning sufficient to pay operating costs. Another expense was the maintenance of unremunerative agencies, forty-four of which reported no receipts, ten did not pay expenses, ten were just making expenses, and the remainder were doing somewhat better. Furthermore, the mail subsidy was considerably less, proportionately, than that of Canada, and the 1921 wage bill had increased by 248 per cent and the material bills by 283 per cent over 1915.[5]

A great deal of criticism was engendered by politics, because the railroad has played a large part for thirty years in the politics of the country, each succeeding government finding it more or less necessary to become closely associated with the railway management, and the party in opposition using this as a ground for criticism and hostility. In the general election of 1919 the then opposition bitterly attacked the then government for having been under the domination of the Reids and pledged themselves, as others had done before them, to make the Reids toe the mark and carry out their contract. A political change took place, the opposition was elected and the tables were turned, for the new administration was charged with being more closely allied with the Reids than any of its predecessors. The reason for this was that at the legislative session of the spring of 1920 an act was passed creating a commission to study and act upon acute problems of the railroad. The Reids had claimed in effect that it was impossible for them to continue the operation of the system much longer without government help, and the Government agreed to furnish $1,000,000 for reconditioning purposes, provided the Reids agreed to supervision by a commission on which

[5] *Canadian Railway and Marine World,* May, 1922, p. 224.

the Government would have four members, one being chairman, the Reids three.

The commission had plans to close the mid-interior section in the winter, to operate the Reid and government steamers as one system, to develop coal fields for the purpose of supplying the railroad, to cut off all passes, and to run a daily transinsular service.[6]

The year's operation by the commission resulted in a loss of $1,650,000 and the commission was disbanded. Sir George Bury was called in early in 1921 to advise the Government, and upon his recommendation an act was passed providing for the operation of the line for a year, under the charge of a Canadian or United States railway man; the nonoperation of certain branch lines during the winter months; the provision of funds for betterments by means of loans, and the payment by the Government of loss on operation up to $1,500,000 for 1921-1922.[7]

On June 9, 1923, the Government and the Reid Newfoundland Company entered into an agreement for the settlement of all claims of both Government and Reids. It was agreed that the Reid Newfoundland Company should retire absolutely from all transportation and docking business in Newfoundland; that the Reid Newfoundland Company should hand over to the Government its steamships, docks, railroads, express business, and telegraph system, together with all buildings, equipment, stocks, supplies, and material on hand; that in consideration therefor the Government should pay to the Reid Newfoundland Company two million dollars; and that all claims by both parties should be considered as finally settled.

[6] *Ibid.*, December, 1920, p. 667.
[7] *Ibid.*, May, 1922, p. 224.

CHAPTER XIV

WHAT DOES FOREIGN EXPERIENCE INDICATE?

An American economist has said, "under government ownership and operation the objective would be the promotion of the public welfare rather than the realization of private profits."[1] This statement seems to beg the question. Public welfare is the objective under either government or private ownership and operation. The question with many honest minds is whether the public interest will be better served under one arrangement or the other. The proponents of private ownership and operation contend that the promise of profits in return for assuming great risks is the strongest incentive yet devised to persuade capable men to enter a business and to try to please the public with good service. The proponents of government ownership and operation rather minimize the strength of the pecuniary motive, and they would fasten upon the taxpayer all the consequences that flow from the risks and hazards of conducting the business of supplying railway transportation; they would turn the management of railway properties over to government employees, believing that such employees would be supervised, disciplined, and directed as effectively as if they were employed by private corporations, and that though free from the continuous pressure of private companies to effect economies and to give service

[1] Eliot Jones, "Principles of Railway Transportation," Macmillan, p. 499.

that would attract business, they would somehow render better service or equally good service at lower costs. Under either arrangement there must and will be continuous service on the railroads. Under private ownership, groups of poeple designated as stockholders and junior bondholders stand to lose all they have committed to the business, in the event of failure. For failure usually means that these types of security holders will be forced out under a plan of reorganization. They must make the property financially successful or lose all they have put into the undertaking. Under government ownership and operation the taxpayers are the owners and any losses are burdens in the end upon the public treasury rather than upon a group of investors. Any gains or profits likewise accrue to the benefit of the public treasury and some Governments, as the German before the War, consciously strive to make earnings of state-owned railroads supplement other sources of public revenue. Under private ownership and operation a group of individual citizens assumes the risks and takes the profits, while under public ownership and operation all of the citizens collectively through their Government assume the risks and take the profits. The question is which of these arrangements will more largely contribute to the public welfare. Either arrangement is a mere device for the promotion of the public welfare. Which will the more surely realize the objective?

When a people have settled down to one or the other of these means of serving the public interest, the burden of proof lies on those who advocate a change. Since the people of the United States have adopted and have consistently adhered to private ownership and operation of their railroads, the burden of proof is on the advocates

of government ownership and operation to show that their plan would better promote the public welfare.

What is there in the experience of foreign countries which would justify the people of the United States in substituting public for private ownership of railroads?

In the preceding pages there is a brief survey of the results of railway management and operation in different countries, in so far as information is available. The greatest care must be exercised in using the rather fragmentary information it is possible for an American student to assemble concerning the results of either public or private operation of railroads in any foreign country. For the convenience of the reader an attempt has been made to compile a short statistical exhibit of some of the conditions of, and results from, railway operation in each country. These figures should be used with the greatest caution. The average miles operated in one country may be about the same as in another, and the condition of the roadbed may be entirely different. One country may report dilapidated and well-nigh abandoned trackage as so many miles of railroad and such undermaintained roads may constitute a substantial portion of the total mileage, while in another country the railroads may be well ballasted, with excellent ties and rails and with much double track. Again, some rather poor railroads, as in Italy, may have an enormous capitalization, while other very good lines, as those privately owned in Argentina, may have relatively low capitalization. One would like to believe that in each country capitalization represents actual investment in properties, and that the greater the capitalization the better the railroad. Furthermore, the figures for the number of locomotives and cars may be very deceptive, for the equipment in some countries may be in a deplorable

state of repair, in some countries in fair condition, and elsewhere the very best possible. Or the number of employees may be misleading, for they may be a low order of African or Indian laborers or the highest type of Western European or American. Again, it is dangerous to compare charges for services, for the currency of a given country may be depreciated, or the rates may be fixed to favor export business, or the Government may be pursuing a policy of more or less secret subsidies to the railroads. Finally it is difficult to compare the services rendered. The classes of passenger service vary greatly from one country to another. First class in many of them is not up to the service on the day coaches in the United States. Freight service is by no means uniform. The character of the traffic varies greatly in different countries. One certainly cannot take a few instances from a few countries, which on their face look favorable to one's cause, and prove the case either for or against government ownership and operation. Too many who have written both for and against government ownership and operation of railroads have subjected themselves to the criticism of having drawn too sweeping conclusions from inadequate or unverified data.

Bearing in mind that the foregoing statistical tables for the different countries are hardly comparable except as to titles, and that in each country there are conditions which the foreign student cannot ascertain at a distance, the question may again be asked, is there anything in foreign experience to justify the people of the United States in abandoning private and adopting government ownership and operation of the railroads?

There are several countries relatively small in territory with large populations and well-developed industries, each of which has a total railway mileage no greater

than that of one relatively small system in the United States. Success with either public or private ownership in such a country cannot be convincing as to what should be done in this country. Holland long has had government ownership and private operation of railroads. Belgium for years had government ownership and operation and has recently turned the railroads over to a private company. Switzerland gave up private ownership in exchange for the proposed benefits of government operation. Though the Swiss have not realized the promised benefits of government operation, they cling to the policy. There is not enough in the experience of these countries individually or collectively positively to disprove the case for government operation in the United States. There is nothing in their experience to make Americans discontented with private operation. Of countries with relatively small area and dense population, Japan seems to be the most successful with government operation of railroads. One might jump to the conclusion that what could be accomplished in Japan could certainly be done equally well in the United States. Yet the Japanese Government is not comparable to the Government of the United States. Japan is governed by an autocracy and an autocratic government is more comparable to a private corporation in managing a business.

Under the leadership of Gambetta the French were almost persuaded to enter upon an era of nationalization of the railroads, only to turn back when it became apparent that the financial burdens their Government would have to assume were too great in the immediate present and too uncertain with reference to the future. Though there have been strong contenders in France for nationalization and much agitation therefor during the past twenty-five years, the French have refused to aban-

don private ownership. It is true that the Government now operates something more than 7000 miles out of a total of 25,000 miles in the country, yet it seems that the Western lines were taken over by the Government because traffic was thin and they apparently could not pay their way. The mileage in Alsace-Lorraine came as a result of treaties adjusting international claims after the War. A comparison of results of operation on the privately operated lines with the results on the government managed roads, after making due allowance for the handicaps of poor traffic on the government lines, shows clearly to the advantage of the private railroads. The private lines are not only managed with much more economy but they supply more acceptable transportation service than do the government-operated roads. Moreover, the privately owned lines in France during the years immediately preceding the outbreak of the World War made a better showing than the government-operated lines in Germany in capacity to lower rates, in economies of operation, and in quality of performance.

When railroads were first built in Germany, a number of the German states were regarded as the personal property of their rulers, and construction of a railroad by such a state meant construction by and for the ruling house. That is to say, it was to all intents and purposes a private project. Later and after private capital had supplied considerable railway mileage in Germany, Bismarck conceived the policy of nationalizing the railroads and used them first in his work of unifying the states of the proposed Empire; second, as a means of military defense and offense; and, third, as a source of revenue toward the support of the Imperial Government. The motives were altogether political. In a memorandum to the Prussian Legislature in 1879 these political advan-

tages of nationalizing German railroads were set forth along with the alleged abuses connected with private management and certain expected economies. A careful analysis reveals that the suggested abuses are no more characteristic of private than of public management. One of these abuses was the existence of private railroads of doubtful solvency and limited capacity to serve. A most cursory survey will disclose that any number of state owned railroads are of doubtful solvency, their credit being bolstered up by the Government, and that Governments have been induced again and again to take over lines that could not pay their way. Often these roads had been built as the result of a policy of government subsidies or guarantees. Moreover, any number of state-operated railroads have a limited capacity to serve. The German merchants and small traders never had as good railway service as was furnished in England. Many German communities were discriminated against in the development of the state lines. Transfer of title of ownership from private corporation to a Government is not a form of legerdemain by which a poor railroad is transformed into a good one. Again it was urged that private lines abuse the privilege of their position. This same allegation can be brought against government lines, and perhaps with more force. It was claimed that private companies resist desirable reforms. Subsequent developments have demonstrated that it is the state-owned lines that frown upon new inventions and novel devices. Supply houses consistently oppose government ownership on the ground that it is so difficult to get state roads to try new devices. It was said that the methods of organization of private companies are complicated and varied. The organization of many state lines show arbitrary variations. The complaint was made that under

private management the tariffs present a chaos. Undoubtedly the greatest progress in working out tariffs in accordance with principles has been made in countries with private management. Finally the memorandum set forth to the German Legislature that quarrels and waste follow the fierce competition of private lines. Countries with private ownership have found ways through regulation of eliminating most of the evils of competition while at the same time retaining most of the advantages.

The Prussian Minister summed up the advantages of a unified system as including the avoidance of the construction of competing lines; the reduction of the number of officers and staff and the amount of correspondence; a unification of tariffs and train schedules; simplification in dealing with damage claims; provision of interchange stations; better use of equipment; and avoidance of duplication of service and of roundabout routing of traffic. There is nothing in this list of advantages of unification as set forth in Prussia fifty years ago that may not be realized under private management. In fact, it has turned out that more progress has been made in attaining these objectives in the United States and England than on the government-operated lines of Germany.

The German Government has used railway tariffs to foster certain industries and to favor given localities, much as the Congress of the United States has used customs duties on imports for similar purposes. The German Imperial Government went so far as to compel states within the empire, against the action of their respective legislative bodies, to bear the expense of constructing railroads considered necessary either in the interest of defense or of the general traffic. If the United States were to adopt government ownership of railroads, the Congress might be urged under the Commerce clause of the Con-

stitution to order the construction of certain railroads to be charged in whole or in part to the states through which they would pass. If such arbitrary powers might not be found to lie in the Federal Government under the Commerce Clause, they might be drawn from the war powers of Congress. Who can foretell what might develop? Did any one in 1879 anticipate that the Imperial Government of Germany would be able to order a state to build a railroad against its will and at its own expense? The period during which German railroads have been operated by a sort of private or quasi private corporation has been so brief and the circumstances have been so unusual that the results may be regarded as being of little significance at this time to a student of government ownership and operation.

Political considerations clearly induced Austria-Hungary to nationalize the railroads and to acquire a large percentage of the mileage under operation. The Government of Austria-Hungary, or of any of the constituent states, did not make a notable success in operating railroads. The roads were made to serve certain interests, as in exporting beet sugar. Obviously government aid and possibly ownership and operation were necessary in Austria-Hungary in order to maintain railway transportation.

It may be observed that both Germany and Austria-Hungary were governed by autocracies before the World War, when they showed to best advantage, in operating railroads. An autocratic government with its high degree of centralization, with its continuity of policy, and with its highly trained bureaucrats, is not at all comparable to the Government of the United States. The operations of the Imperial Government of Germany in conducting a business would be more comparable to the operations

of the Standard Oil Company, the United States Steel Corporation, or the Ford Company than to the operations of the Government of the United States.

In the case of the autocratic government as in the case of the private corporation, there is definiteness of aim, responsible direction, sustained effort toward the reaching of a given objective, continuity of policy, strong incentive to prevent wastes and to create the desired services at the least cost. In matters of effective discipline and in stimulating the highest order of effort, the advantage appears to lie with the less complicated private corporations. But the similarities between the business methods of an autocratic government and of a private corporation are striking, though the average of performance of the government may fall below that of the corporation. In a democracy or a representative government, no such efficiency in operating a business by the government can be reasonably expected. A representative government, while much more satisfactory to the governed, is not as efficient a business organization as is an autocracy. A representative government was not conceived as an organization for engaging in business enterprise. In fact the philosophy of some of the most able advocates of representative government was that the least government is the best government.

In Italy a commission made a most exhaustive study of the relative advantages and disadvantages of government ownership and operation and reported in favor of privately owned and managed railroads. But there was no industrial basis of support for Italian railroads. The cost of construction had been high, maintenance had been haphazard, expenses of operation were high because of high cost of fuel and other supplies, and traffic was not remunerative even at high rates. In order to have the

political and social as well as the economic benefits of railway transportation it was necessary for the Government to assume heavy burdens in connection with their upkeep and operation. An almost absolute autocracy now has charge of the Italian railroads. Americans hope to be spared such a government in the United States.

The conditions in countries like Czechoslovakia, Jugoslavia, Bulgaria, Greece, Turkey, Roumania, Estonia, Latvia, and Poland are more or less abnormal following the political and economic upsets incident to the War. The railroads were permitted to fall into disrepair or were partially destroyed during the War or during the disturbances following the signing of the Armistice. Some mileage reported as in existence and which the unwary might suppose to be good railroad, cannot be operated. The equipment in numerous instances is of the poorest. While conditions vary from one country to another and are improving in places, it would be futile to try to draw conclusions as to results of operations under such circumstances. In most instances there has been nothing else that could be done except to let the Government worry with the railroads. The governments have not in every instance been stable, and have tried to operate the railroads under many handicaps which do not exist in this country and which it would be difficult for Americans to visualize.

Russia had an autocratic government when railroads were built. The autocracy of Russia was not a notably efficient government during the half-century preceding the overthrow of the Romanoffs. Many of the deficiencies in the railway service and in tardiness in construction of lines for which there was economic justification may be laid to the door of the non-enterprising rulers. The autocracy of the Czar has been supplanted by an autocracy

known to the world as Bolshevism. This régime may prove to be more efficient in railway management than its predecessors. The Bolshevik Government is making repairs of existing railroads and is extending construction of new roads with a view to opening up new territory to development or to make markets available to rather isolated producers. If the present Government perpetuates itself for a long period the railway management will have an opportunity to demonstrate what an autocracy may accomplish in that field of economic endeavor. The success or failure in railway operation by an autocracy in Russia has no more significance for the people of the United States than a similar performance by the absolute dictator of Italy. Americans do not contemplate that kind of government for themselves. What could be done or could not be done by Bolshevist or Fascist Government would not be conclusive as to what should or should not be undertaken by the representative government in the United States.

Japan's is another relatively autocratic government which seems to be doing well in operating railroads. The construction of the roads under Japanese control seems to be good, the equipment is suited to the requirements, the service is comparable to that of the best railroads in Western European countries, the costs per unit of service are apparently rather low.

The history of railway development in China affords a striking example of how government ownership and operation or some modification or adaptation thereof may be used to protect and to attract private capital especially from foreign investors. The desire and necessity of attracting foreign capital explains most of the government ownership of railroads in Asia, Australia, Africa, South America, and in the smaller countries of Eastern

Europe. In the United States, government guarantees are not necessary in order to obtain capital for railroads.

In the Latin American countries, railway service is of every variety from the poorest to good. Privately owned and operated companies seem to render the best service at the lowest costs. Private companies have in many cases obtained guarantees or subsidies from the Government. Where governments have been able to secure the capital, they have in many instances built railroads, sometimes to operate them, sometimes to lease them to private companies. Where governments have taken the initiative, the roads have sometimes been planned with a view to opening up the resources of the country, and sometimes with quite different objectives, as for military defense, or to favor some politically influential locality or faction. Latin American Governments have not as a rule been distinguished for their success in finance. The fact that in most cases government operation of railroads in South America, in Central America, or in Mexico may be said to have failed, throws no special light on a question of policy for the United States. While Latin American Republics are supposed to have representative government, yet the processes of electing officers, of ushering in or of overthrowing administrations, the methods and practices in dealing with and in accounting for public funds, and the temper of the people, are very different from what we find in the United States.

In the British possessions, each colony or dominion has had the benefit of the best counsel available in the British Empire. Guidance has not only been available through the highly developed civil service, but the best minds among the business men of the homeland have from time to time been applied to the transportation problems of a specific possession. When railroads were desired in Aus-

tralia, there was not enough free capital in that country to supply the roads. Capitalists in England were willing to raise the needed funds, but they demanded as security the Colonial Government's bonds. The people of Australia furnished hardly any of the capital that went into the railroads. With the initiative of pioneers, they decided to operate the railroads since they were guaranteeing from taxes payments on the investment. English investors were quite willing to have the Government operate the roads, since they were looking to the Government to pay interest and create sinking funds with which ultimately to repay the loans. These investors were perhaps shrewd enough to see that the properties themselves could hardly pay the fixed charges for many years. With variations a similar situation developed in the South African Union, and in certain portions of India. The better railroads and the most successfully operated in India appear to be those which are privately owned and operated. British capitalists frequently exacted provincial guarantees or subsidies in India even where private management was put in charge of operations. In South Africa, there was more nearly a repetition of the experience in Australia. The South African Union was particularly fortunate in having the services of a most able railway operator in Sir William Hoy. He seems to have been complete master, and the legislative bodies appear to have trusted him almost implicitly and to have left him free from any political interference. Whether the South Africans will be as fortunate in the successors to Sir William remains to be seen.

In less advanced possessions the resident representative of the British Government is clothed with wellnigh autocratic powers in dealing with or in managing colonial railroads. The railroads are planned by the in-

vestors who undertake the development of resources or marketing operations. The Colonial Government works in coöperation with such a group of investors. Very frequently it is found that it is easier to obtain capital for desired railway construction by having the colony assume complete financial responsibility for the capital borrowed and for operating the road after it is built. In such a case the railroad is owned and operated in the name of the colony. But in reality it is done by and for the group of promoters and capitalists who are exploiting the colony, and the management, though colonial, is of their choice and works pretty much as they direct.

Canada found that in following the practice common in English dominions she had guaranteed the bonds of several thousands of miles of railroad in order to persuade British and other capitalists to lend the funds necessary to build the roads. This went forward until the railway net was greatly extended beyond the requirements of existing or immediately prospective traffic. As a result of overbuilding, the companies were threatened with bankruptcy. In order to prevent receiverships and to protect the credit of the Government from the consequences of railway failures and the clamor of bondholders who held the Government's guarantee, the Canadian Government took over what are now called the Canadian National lines.

Throughout the British possessions there appears the tendency to overbuild the railroads. This is difficult to avoid in a new and developing country. It was done by private capital and with the encouragement of the Government in the United States. There are so many advantages to be derived from railway transportation that people are eager to have more and more railway mileage. Pioneers and frontiersmen particularly are apt to over-

strain their energies for primary railway construction. Again and again Royal Commissions have been appointed to study ways and means of relieving the burden of maintaining and operating railroads in one British possession or another. On such commissions are often to be found the greatest railway authorities in the Empire. In each case the colony has taken upon itself great financial responsibility in order to obtain railroads. Usually the Colonial Government is operating the roads. That makes the problem of burden bearing important for all the people of the colony. They are told that they own the railroads; they have promised to pay for them; they must have them operated. Therefore, it is proper to supplement railway earnings with the income from other enterprises to be obtained by taxing these other businesses. Private capital could hardly be induced to build a railroad in a new country already served by as much or more railway mileage than the traffic will support, if it had to look to the property alone for repayment of investment and interest. In order to get such construction as well as that more needed, the Colonial Government offers subsidies and guarantees the bonds, or even issues its own bonds in payment. If foreign investors merely owned the railroad and managed it themselves or through their agents and it should fail, they would lose most of their investment. But if the Government owns it and it fails, they can look to the Government to pay them out of the general revenues of the country. This is the chief explanation of government ownership, not only in British possessions but in the colonies and dependencies of other countries as well.

CHAPTER XV

EXAMPLES OF AMERICAN EXPERIENCE IN GOVERNMENT OWNERSHIP AND OPERATION OF CANALS

In Chapter XVII there is a discussion of government operation of railroads during and immediately following American participation in the World War. In a book devoted to a discussion of government operation of railroads it is hardly practical to enter into any lengthy consideration of the policies controlling the operation of other public utilities. However, brief reference may be made to some instances of state and municipal ownership and operation of some of the public utilities.

The problems involved in the ownership and operation of purely local utilities, such as waterworks and sewage-disposal plants, are more simple as well as different from the problems arising out of the ownership and control of utility plants which serve more than one community. There is not much in the success or failure of a municipality in managing a purely local utility that will throw light on the problems growing out of public operation of intercity or interstate activities.

Communication by wire has been developed almost altogether by privately owned corporations. There is no American experience in public ownership and operation of telephones, telegraph, and radio, which would be helpful in determining questions of ownership and operation of railroads. In the main the same observation may be

made with reference to agencies that manufacture and distribute gas for two or more communities. The manufacture and distribution of artificial gas has been largely local. Pipe-line companies in most instances carry natural gas across state lines and for relatively long distances. The transportation of oil through pipe lines has likewise been almost altogether a private enterprise. Intercity transportation by electric lines has for the most part been by private corporations. A large percentage of electric power and light plants have been and are municipally owned. These as a rule serve only one locality, and usually the credit of the city was necessary to obtain capital for the local enterprise. Plants serving two or more municipalities are almost without exception privately owned.

There is a considerable body of state experience in the ownership and operation of canals. Some canals were built outright by states, others were subsidized and afterwards acquired by states. On the whole, several of our states during the first half of the nineteenth century owned and operated canals. In view of these experiences it seems advisable to indicate some of the results of state ownership and operation of canals and railroads built to supplement canals.

Pennsylvania

The State of Pennsylvania engaged quite extensively in developing what was termed State Works; that is, railroads and canals—for the most part, canals. The experience of Pennsylvania in financing public works is not without significance. The first loan negotiated in order to begin construction of canals was for $300,000, authorized by a legislative act of 1826.[1] Within two years per-

[1] Laws of Pennsylvania, 1825-26, p. 168.

manent loans were made to the sum of $3,300,000. With a view to increasing the State's credit, taxes were levied in the amount of one mill on the dollar upon personal property not subject to county rates and levies, and an increase of one mill on the dollar was made on all county taxes and levies. Though the income from these taxes was not sufficient to pay interest and provide adequate sinking funds, the State was able to borrow large sums at comparatively low rates.[2] It will be remembered that the first half of the decade 1830 to 1840 was a period of great prosperity, of easy money, and of inflation in several lines of industry. By 1835 the state debt was $24,590,000 of which $22,420,000, had been incurred in the construction of canals and railroads.[3] By November 30, 1843, the total amount expended on various state works was $53,-350,000.[4] The total expenditures of the State on internal improvements up to the time of their sale was $101,611,-000. The total loss to the State of Pennsylvania by reason of its venture in the field of the ownership and operation of public works was $57,825,000 in cash plus practically all of an indebtedness of $40,000,000, making a total of nearly $100,000,000.[5]

The causes for the serious financial embarrassment of the State during the years 1839 to 1843 were in the main, first, the spirit of speculation that was common to many of the states during most of the time that the public works in Pennsylvania were being constructed; second, an over-extensive program of internal improvements;

[2] Hammond, "Tabular View of the Financial Affairs of Pennsylvania," p. 14.
[3] Governor Wolf's Annual Message, December 2, 1835, in J. H. Rep., 1835 to 1836, II, p. 11.
[4] A. L. Bishop, "The State Works of Pennsylvania," publications of Yale University, 1907, Vol. XIII, p. 222
[5] *Ibid.*, p. 229.

third, an alliance with the United States Bank of Pennsylvania; fourth, unsound financial legislation.[6]

It may be asked why the legislature did not resist the temptation to overbuild the system of canals and why it was that after having entered upon so extensive a program it did not work out an adequate scheme for financing the projects. It seems that the legislature adopted almost every possible expedient except adequate taxation in order to secure revenue to meet the increasing demands which the program of public works made upon the State treasury. There was at that time in Pennsylvania a reluctance of the people to pay taxes. This was nothing uncommon and is characteristic of any citizenship. There was also undue optimism in forecasting the earning capacity of the public works. That, too, was an inevitable consequence of representations made to legislative committees and in turn by members of the legislature to their constituents in justification of additional bond issues.

When it became apparent that Congress would not renew the charter of the Second Bank of the United States which expired in March, 1836, there developed in Pennsylvania an agitation for getting a charter from that State. The scheme was so presented as to make it popular. It was made to appear that there would be obtained by the State a considerable sum of ready money and a means for placing loans upon easy terms.[7] An extensive patronage had grown up under the expenditure of nearly $25,000,000 among contractors and under the appointment of many operators on the public works. This had developed a strong party in favor of any move-

[6] *Ibid.*, p. 224; also Dewey, "Financial History of the United States," p. 230.

[7] Bishop, *loc. cit.*, p. 214.

ment which would provide for the extension of public works. In February, 1836, a bill was passed entitled "an Act to repeal the State tax on real and personal property, to continue and extend the improvements of the State by canals, and to charter a State Bank to be called the United States Bank." This act has been characterized as "a piece of corrupt legislation. Its corruption was addressed to the people of the State, not to private individuals. It comprised three projects in an obvious log-rolling combination—remission of taxes, public improvements, and bank charter." [8]

The act of the Legislature which launched the policy of extending the state works in Pennsylvania was the direct result of logrolling.[9] In laying out extensions, there were cases of gross favoritism. Men were retained and discharged from the service merely because of their views on politics. Again and again unscrupulous employees betrayed the trust of their officers. In an official report, the following attempts to defraud the State of Pennsylvania were set forth; [10] time was charged for work which was not performed; teams were charged in the name of persons who had no teams on the work and in some instances the amounts of the charge were receipted for without the knowledge or consent of the person in whose name the account was kept; teams were charged at full or high prices although the driver's name was charged in a separate account; public teams were freely donated for the use of private individuals, though their time was charged on the state payroll; at certain times large amounts of money were expended for get-

[8] Sumner, "Andrew Jackson as a Public Man," p. 338.

[9] For an authoritative discussion of corrupt practices connected with the building and operation of public works in Pennsylvania, see Bishop, *loc. cit.*, p. 229 ff.

[10] J. H. Rep., 1840, II, pp. 234-5.

ting labor to replace hands who had been discharged for political reasons; extra time was added to the payrolls at the will of those having charge; time was continued after employees had quit work; articles never purchased or used were charged up to the State; many persons were induced to write receipts for money which they had not received; bribery was attempted for the purpose of procuring public funds and took place to secure favorable legislation; the time of teams and men was charged to the State when the goods they were alleged to have delivered were purchased at a price to include delivery; officers and laborers received pay and travelling expenses while on political errands; many persons were employed at high salaries who were without skill or experience; foremen and others used state employees in slaughtering cattle and then sold the meat at a high price to the account of State Works; provisions were charged to the State at prices higher than those current in the markets; a large amount of whisky was charged to the State; payrolls were often mutilated; payments were made by the canal commissioners for damages where the claims had already been settled and releases executed therefor; the expenditure for wood alone in the engines on the state railroads rose from $19,000 and $26,000 in 1850 and 1851 respectively to $107,000 and $108,000 during the two succeeding years though there was no explanation for the increase.

In 1854 a Senate Committee made the following report:

> The officials and agents of the system, whose name is legion, extend to all parts of the commonwealth,—a vast engine of political power, unknown to the constitution, moved by common impulse, and operating upon the public mind at any time they are so disposed, in state conventions and at the

ballot box, in solid column, and with almost irresistible sway. But it is not as a dangerous political machine that it is viewed in its worst aspects, nor as an exhausting drain upon the public purse; its malign influences upon the morals of the community are even more to be dreaded than all other evils, and powerfully coöperate to make it a festering disease upon the public. At every stage, complaints have been made of the extravagance, fraud, and speculation in the conduct of the works, and the most honorable agents have been stigmatized with odium by an indignant public, smarting under the known abuses and heavy burthens they have generated. Attempts to reform, however loudly professed and honestly made, have been unavailing to eradicate evils inherent in the system. . . . That practices at war with the established systems of political economy have resulted in debt, taxation, extravagance, mortification, and disappointment is a misfortune. Had the object of this anomalous system been to destroy and not to build up the revenues and the morals of the state, it could not have been more ingeniously devised.[11]

One writer [12] has stated:

Millions of wealth were squandered in construction, the public were punished or rewarded as they denounced or sided with those in position, employees were plundered by so-called assessments, and the ballot box polluted for the purpose of perpetuating power. All the avenues of government were completely corrupted, state credit collapsed, and the public improvements of Pennsylvania became public scandal. . . . It was not an infrequent occurrence on election day to see the gravel train loaded down with men moving from town to town with the scarcely disguised intention of polluting the ballot box—repeating at the polls became the rule along the line, and waiting in expectation for the gravel train to come in was the occupation on election day of the local adherent

[11] Leg. Doc., 1854, p. 329.
[12] William B. Wilson, "History of the Pennsylvania Railroad Company," Vol. I, p. 40.

of the railroad boss. Personally, I have seen the paymaster, after requiring the employee to sign the payroll for the full amount of his pay, count out the amount, less ten per cent, and without a word of comment unblushingly take the latter and put it in a bag made for the purpose, and labeled "Political Assessments." The public service became gorged with the friends and adherents of those in power, whose principal duty seemed to be to sign the payrolls, submit to assessments, and vote the ticket handed to them.

The movement for the disposal of the state railroads and canals originated before 1844. The question was submitted for popular vote and the people gave the Legislature a mandate to sell the properties. Again and again public opinion was tested and the properties were eventually disposed of at tremendous loss. All the canals were sold for the aggregate sum of $3,875,000.[13] It seems that the people of Pennsylvania were convinced that any price was better than the retention of the properties by the State. The railroads owned by the State were also disposed of to private corporations.

New York

The State of New York was quite active during the first half of the nineteenth century in aiding and promoting internal improvements. The most notable achievement was the construction of the Erie Canal under an Act passed in 1817. After the opening of the Erie Canal in October, 1825, the State entered upon a rather extensive program of canal construction and of assistance to railroads. Between 1827 and 1842 the State issued its bonds to canals and railway companies in the following amounts:

[13] See Executive Documents, 1858, Governor's message, p. 6; also Bishop, *loc. cit.*, p. 259.

Delaware & Hudson Canal Co.	$ 800,000
New York & Erie R. R.	3,000,000
Canajoharie & Catskill R. R.	200,000
Ithaca & Oswego R. R.	315,700
Auburn & Syracuse	200,000
Auburn & Rochester	200,000
Hudson & Berkshire R. R.	150,000
Tioga Coal Iron Mining & Mfg. Co.	70,000
Tonawanda	100,000
Long Island R. R.	100,000
Schenectady & Troy R. R.	100,000
Total	$5,235,700

Of this sum the State failed to recover $3,665,700. That is to say, more than three and a half million dollars represented what amounted to a clear donation by the taxpayers to certain of the projects including the New York & Erie Railroad.[1]

During this period there was no objection among legislators to the policy of state construction of canals except on the ground of the burden to the taxpayers. It was recognized that in order to obtain canals it would be necessary for the State to finance the larger projects. Americans were having to borrow very extensively abroad in order to obtain capital for industrial and commercial development. Foreign capitalists insisted upon better security than an untried private undertaking would afford. Moreover, in order to obtain funds at home it was often necessary for the State either to advance revenues obtained through taxation or through the extension of its credit. At the present time it is rather hard to appreciate such difficulties, for during the past half-century this situation has completely changed. There is so much of private capital seeking investment that any reasonably promising project can obtain funds without state assistance.

[1] Don C. Sowers, "The Financial History of New York State," Columbia University, Studies in Political Science, Vol. 57, p. 87.

During the early years of canal construction, state aid appeared to be necessary in order to obtain the desired capital. First and last New York expended large sums upon canals and other works.

The original cost of the Erie was $7,143,790. In 1835 a bill was passed entitled "An Act Relating to the Erie Canal" which provided for enlarging and improving the canal. The bill passed with scarcely any debate. It had been estimated that the time required for the work would be twelve years; however, it consumed twenty-seven years and cost over $30,000,000. The total amount of taxes collected on account of the canal fund from 1846 to 1882 was $38,700,000,[2] which sum was spread over the various canals of the State. In 1895 $9,000,000 of four per cent New York State Bonds were authorized by the Legislature for the further enlargement of the Erie Canal. In 1903 the Legislature passed the Barge Canal Act which was approved by the people at a general election. Under this Act the depth of the canal was to be increased from seven feet to twelve feet and the locks were to be greatly enlarged. The Act provided for issuing eighteen year bonds to the amount of $101,000,000.

The above recital is sufficient to show the interest of New York State in internal improvements. What were the consequences of the expenditure of very considerable sums of money under state direction? Paticularly in the earlier period, the legislature seemed to be disposed to appropriate money and extend the credit of the State rather freely, while it at the same time showed considerable reluctance in providing for adequate taxes to retire and meet the obligations which it created. In 1836 the Governor of the State said, "The improvident plan

[2] *Ibid.*, p. 94.

of borrowing money without providing available funds for paying the interest has already been carried to a point beyond which it cannot be pushed without serious mischief. On a part of the debt the interest can only be paid by new loans unless you resort to taxes of some kind." In 1838 the Comptroller said, "It is going to the utmost verge of prudence to create a debt sufficient to absorb the whole annual surplus in paying interest, and at least the prospective increase from tolls ought to be left untouched, as a sinking fund, to redeem the principal of the debt." [3]

The Comptroller also lamented the failure of the Legislature to take into account the certain and inevitable expenses of keeping the canals in repair and collecting the tolls. The Legislature ignored these warnings of the Governor and the Comptroller and in 1839 adopted a plan which may be said to have avoided the necessity of resorting to taxation and of adjusting the loans of each year, so that the annual interest on the whole debt might fall within the income of the State. That is to say, the plan was to borrow as long as the surplus tolls from the canals afforded means of paying the interest without making any provision for paying the principal.[4] The result was great impairment of the credit of the State. In 1843 the Comptroller pointed out, "It is not now a question whether the completion of the canal will be beneficial to a particular section, but it is a question of solvency or insolvency. The impulse for internal improvement and local interests regardless of the condition of the finances has pressed the State to the very brink of dishonor and bankruptcy." The result was a suspension of public works for a time and the levying of a tax to redeem something

[3] Annual Report of Comptroller, 1838, p. 21.
[4] Sowers, *loc. cit.*, p. 69.

more than $5,000,000, of short-term bonds which were issued to meet some of the most pressing obligations of the State. As a consequence of legislative liberality in making appropriations and ultraconservatism in raising funds to meet the obligations, the people of the State revised their constitution in 1846 with the following financial provisions:

The credit of the State should not be loaned to any corporation. State loans should not exceed $1,000,000. Whenever a debt was contracted a tax should be imposed sufficient to pay the interest and principal of the debt within eighteen years. Out of the net revenues of the state canals, amounts should be set aside as a sinking fund to pay the canal debt.

In 1846 the first canal investigation revealed that there was plentiful evidence of extravagance and that more or less corrupt practices existed. Reports were made that laxity on the part of Canal commissioners had resulted in taking large sums from the treasury for work unauthorized by law.

Five years after the adoption of the new constitution with its restrictions, a scandal developed in connection with bids on Canal work. After another legislative investigation a majority of the Committee attempted a whitewash, and reported that the contracts were in fact proportioned fairly between the two political parties. They advanced the argument that the law sanctioned by all experience has repudiated the idea of letting the work to the lowest bidder.[5]

Two years later another investigation revealed that extravagant expenditures had been incurred on one of the divisions of the Erie Canal which were unauthorized and were unconstitutional. One of the commissioners was

[5] *Ibid.*, p. 78.

found to be guilty of illegal expenditures and was impeached for high crime and misdemeanor.

Looking back over the experience of New York State, one must conclude that building the Erie Canal contributed largely to the development of the port of New York, had great influence in stimulating trade and industry, and increased the wealth of the entire State. Moreover its construction contributed to the occupation and development of the country adjacent to the Great Lakes. It made possible a geographical division of labor, which resulted in increased incomes to many thousands of people. These economic benefits seemed to justify the initiative and enterprise of the State, though delay in building canals would have hastened railway construction and in the long run might have brought equally desirable economic benefits. State assistance to the railroads hastened railway construction and greatly accelerated the movement toward division of labor, specialization, commercial and industrial development, which had been stimulated by the construction of the canals.

The question has been raised from time to time as to whether or not these benefits might not have been obtained through private operation of the canals and at a lower cost to the entire citizenship.[6]

To mention some of the conclusions that have been reached it has been pointed out that the management of the canals became involved in politics and regardless of what party might be in power taxes were not levied when conditions required it, and credit was rather recklessly extended. Canals were authorized for which there was clearly no economic justification. Canal officials were frequently appointed with reference to their political affiliations, and contracts were awarded to political favor-

[6] Sowers, *loc. cit.*, p. 109.

ites. Again the State failed to work out an adequate financial plan. Prior to the constitution of 1846 there was no provision for the payment of the principal of loans. After permanent sinking funds were established, the money in them was used to anticipate taxes which had not been levied and was expended for present needs. The Legislature followed a rather hand-to-mouth policy in dealing with internal improvements. Lack of an adequate plan made any comprehensive engineering project impossible. Preliminary estimates were almost always too low and subsequent expenditures far beyond what had been supposed to be necessary. "The delays, extensions, and additions resulting in extra charges, the disputes over charges, political intrigue and interference, and the cost of legislative investigations all tended to increase the cost of construction." [7] There was lack of definite responsibility on the part of those who were charged with managing the public works. One official was able to shift the blame to another. There was much fraud and corruption. The various legislative investigations revealed that public interests were flagrantly disregarded. For example, again and again canal commissioners would issue drafts after they had been notified that no funds were available for the work. Superintendents purchased supplies from private firms of their own selection instead of in accordance with the law. The law requiring that contracts should be let to the lowest bidder was systematically circumvented. Much of the work done by contractors was of poor grade and soon became worthless, though claims against such contractors were not enforced. Inspection was wholly inefficient. At the close of the Civil War, the State Comptroller claimed, "The canal cost perhaps twice as much as it would have cost under private management."

[7] *Ibid.*, p. 111.

At first there were relatively high tolls on the canals which yielded surplus revenues. Later a scheme of free tolls was resorted to and expenses of maintenance and operation were transferred to the taxpayers.[8] In closing his study of internal improvements in the State of New York, Professor Sowers, in 1914, stated the following conclusions: [9]

The real question today is not whether an equitable system of taxation can be devised for raising the funds to defray the expenses of these public works, but whether the money so raised will be economically and justly expended by public officials. In all industries which call for the introduction of new technical improvements, for the extensions of plant or system, changes of plans and wise discretion in management, it would seem unwise to allow such industries to be managed by governments, whose policies are subject to the fitful changes of party politics. To manage successfully such utilities as canals and railroads it is necessary to devise some comprehensive plan requiring a long term of years for its fulfilment, and this is not easily possible under government control. Furthermore, the Legislature has shown itself unfit to cope with the intricate financial problems which are involved in the successful operation of such industries. Utilities such as these which affect so intimately the life of everyone in the community are sure to become the storm centers of political discussion, as has been the case in New York State, and the farther they can be kept removed from the field of politics the better it will be for the people and the state.

[8] The claim is sometimes made that the Erie Canal paid for itself by 1882, and that free tolls are therefore justified. This claim is perhaps based upon a financial statement shown on page 13 of the Annual Report of the State Engineer and Surveyor of the Canals of New York for the fiscal year ending September 30, 1882. The figures there set forth cannot be checked as to accuracy. The accounts kept from 1817-1882 left much lacking. The statement does say that interest paid on canal loans was not included. In a fair statement, interest at the minimum rate for safe investments would have to be computed on the entire investment and for the periods of the respective amounts invested. If that were done the statement would show a loss instead of a profit in operating up to 1882.

[9] *Ibid.*, p. 113.

Georgia [1]

By 1830 it was apparent that the best cotton lands of the South were west of the older settlements of Colonial days. When the Indians were removed from Georgia and Alabama, great numbers of families began to migrate westward. New land on which cotton could be grown with slave labor was an irresistible lure to restless and enterprising frontiersmen. Charleston and Savannah were ambitious to be the ports which would serve the back country at least as far as the eastern line of Mississippi and up to middle Tennessee. In competition for the trade of the central Georgia cotton belt, Savannah had the advantage over Charleston in that the Savannah River furnished access to the cotton lands. The people of Charleston overcame this handicap by building the South Carolina Railroad from Charleston to Hamburg, Georgia, on the Savannah River, a distance of 136 miles. The road was opened through to Hamburg in 1833, being the longest, at that time, in the world. By that time an idea of a railroad from the Atlantic to the heart of Tennessee had taken firm hold in the minds of the people in both South Carolina and Georgia. In December, 1836, the State of Georgia committed itself to such a project.

The bill passed by the Legislature of Georgia followed the recommendations of a committee of forty men who had been appointed by a convention on railroads at Macon during the month of November, 1836. The plan called for a trunk line of 130 miles to be built from a point on the Tennessee River southeastward into Georgia where branch lines would be built to connect with the three navigable rivers of the State. At some point near the

[1] This section is largely based upon "The History of Transportation in the Eastern Cotton Belt," by U. B. Phillips, Columbia University Press, 1908.

Chattahoochee River the road would branch and thus reach the other railroads of Georgia. It was provided that the main line should be built with state funds, and that the branch lines should be built by private companies to the stock of which the State might subscribe in an amount not in excess of $200,000, in any one company.

The conception of this project was statesmanlike. Private capital was not then available to build so much railroad in a new country. Through construction of this railroad, Georgia assured the development of a railway system and resulting economic progress. "For the ante-bellum period, the Western and Atlantic Road was the cap-piece to the railway system which caused Georgia to enjoy well-nigh the whole commerce in Western produce imported by the eastern cotton belt. The addition of this trunk line brought it about that all railroads in adjacent States must hitch themselves to the Georgia system, and thus secure for their patrons the grain and meat which the planters were anxious to leave off raising, in large part, in order to concentrate still more closely upon their great staple of cotton." [2]

In 1837 it was provided that the railroad should be managed by three commissioners to be elected by the Legislature. In 1841 the Commission was succeeded by a disbursing officer. Ten years later the Legislature placed control of the railroad in a general superintendent to be appointed by the Governor, and in important matters to act with the Governor's approval. This was the arrangement for managing the property until 1870, when it was leased to a private company.

The construction of this railroad, commonly known as the Western & Atlantic, was attended by many difficulties

[2] U. B. Phillips, "History of Transportation in the Eastern Cotton Belt," p. 334.

and delays. The State of Georgia appropriated $350,000 a year toward the building of the main line. Later this was increased by a provision for the sale of $500,000 of state bonds in any one year. In 1838 these provisions were supplemented and superseded by an appropriation of $1,500,000 of six per cent state bonds. The Central Bank of Georgia had been established by the Legislature in 1828. This bank was in effect the State Treasury with a rather reckless banking system annexed. For a time the bank financed the construction of the railroad, which it had been planned to open for operation by 1840. The panic of 1837 had the effect of cutting off the Central Bank as a source of funds for the railroad. It was difficult to sell state script. In 1842, the contractors suspended work for lack of financial support.

In 1841 the commission reported an expenditure of $2,600,000, much of it outstanding in state bonds. The commission also advised that the lower 52 miles be completed and that the northern portion of the road be neglected. Between 1843 and 1845 rails were laid on the 52 miles. The railroad was finally completed to Chattanooga in 1851. From 1838 to 1850 there was a spirited debate at each legislative session on the merits of continuing or abandoning the road, of retaining it as state property, or selling it. In 1843 the Governor was authorized to sell the railroad if he could get one million dollars for it as it stood. This provision remained in effect until 1850, but no buyer appeared. In 1851-52, the Legislature appropriated $500,000 to buy rolling stock and to replace the flimsy rail with good rail.

With the opening of the railroad for business, it was placed under the management of a superintendent who was to be appointed by and to represent the Governor. A competent man was brought from the Central of

Georgia and made a good beginning as superintendent. In 1853 he went back to the Central and four different superintendents served before 1857, when Governor Brown appointed an able man and managed to keep him for three or four years. There had been much agitation to lease or sell the road after 1853. The State was paying six per cent on six million dollars the road had cost, and the road was paying from nothing to one per cent on the investment. Governor Brown expressed great confidence in the future of the railroad and silenced agitation to sell it first by offering to buy it, and second through sound management. But with the utmost alertness and economy it proved impossible for the road to earn a percentage on its cost commensurate with the dividends which the neighboring company roads were declaring on their stock. Governor Brown's superintendent pointed out that no such showing could be hoped for. The state road had been badly laid out and had been built with unquestioned extravagance. Prior to 1857 there had been extravagance in salaries and in wages.

At the outbreak of the Civil War the railroad was in good condition. At the close of the War it was a rough patchwork of damaged and crooked rails, laid on rotten crossties and on rough poles. Eight miles at the upper end were missing.[3] The rolling stock was fit for the scrap heap. In 1866-1867 there was considerable rehabilitation. In 1868-1869 a capable administrator was in charge but there was no improvement in the road. Thereupon came a superintendent who saved from $20,000 to $30,000 a year out of a salary of only two thousand dollars a year. Upon being asked in an investigation how he had achieved so marvelously, he replied that it was "by the most rigid

[3] U. B. Phillips, "History of Transportation in the Eastern Cotton Belt," p. 331.

economy." By the autumn of 1870, officials of connecting lines declared the condition of the track of the state railroad too dangerous for them to trust their cars on it. A bill passed the Legislature providing for the lease of the road to a company which had been organized by ex-Governor Brown, the only state executive who had managed the property to the satisfaction of the people. In 1890 when the lease expired the property was leased for thirty years to the Nashville, Chattanooga & St. Louis Railroad Company for $420,000 a year. At the expiration of the thirty years the lease to the Nashville, Chattanooga & St. Louis was renewed for fifty years at an annual rental of $540,000 and additional expenditures for additions and betterments applied to the property averaging $60,000 per year during the term of the lease.

While the State of Georgia was justified in building this railroad and did well to construct it, state management was not satisfactory. Carelessness, inefficiency, and extravagance characterized the construction. Rapid changes in management and instability of tenure in the office of superintendent were inevitable since the railroad was controlled by the Governor and one of his appointees. The management of the railroad may be said to have fluctuated from good to poor and from poor to mediocre quality with two exceptions. One of these exceptions was just prior to the outbreak of the Civil War when an able Governor appointed a competent superintendent and made the most of a period of prosperity and growth of business. The other exception was the period of flagrant corruption which characterized the "reconstruction" management during the period immediately preceding the leasing of the property to a private corporation. The State's interest in the railroad was from the outset a source of irritation and frequent perplexity to the Legislature. From

time to time the citizens were more or less agitated by charges of maladministration. Such charges were usually disproved. One Governor was of the opinion that the advantage of the little patronage the railroad might afford was more than offset by the disadvantage of having to disprove charges of inefficiency or worse, and by the burden of administering the railroad.

Ohio

From the date of its admission into the Union in 1803 until 1825 the State of Ohio had no funded debt. In 1825 the State incurred a funded debt for the purpose of constructing canals. By 1835 there had been created an indebtedness of the State amounting to $4,433,000. During the first ten years of debt-making two important canals had been built by the State.[1]

During the first decade of canal construction the public works were laid out with wisdom, and prosecuted with economy. In providing funds for relatively extensive public works during the ten or twelve years following 1825, however, the state authorities of Ohio showed less wisdom than in developing the work. Although by law they were required to maintain a sinking fund, it is a fact that they did not keep it intact. One cannot state exactly when the sums credited to the sinking fund were first borrowed by the Commissioners of the Canal Fund for Canal Construction, but the policy was entered upon soon after payments were made into the sinking fund. First and last, about $2,000,000 was taken from this source. The Canal Commissioners also borrowed from school funds credited to the counties to the amount of $1,567,000. Such transactions had the effect of preventing the burden

[1] E. L. Bogart, "The State Debt of Ohio," *Journal of Political Economy,* April, 1911, p. 249 ff.

of large expenditure for canals being felt immediately and directly. The people of the State were in a measure deceived by this juggling of state funds and did not realize just how much their indebtedness was being increased. One observer said, "By means of that deception they tolerated this rapid expenditure in the public works in the State of Ohio, and by that means our debt accumulated to its present amount ($16,000,000 in 1850). Had they adhered to the provisions of that law, the burden of taxes would have been felt by the people as the debt increased and they would have checked the expenditure at the proper time." [2] The most striking feature in the entire history of the state debt of Ohio was the complete disregard of all sinking fund provisions.[3] "However skillfully the accounts were juggled, and however carefully the indebtedness of the canal fund to the sinking fund, to the school funds, and to others was recorded, the indisputable fact remained that the sums pledged to the sinking fund were expended for canal construction and not for debt payment." [4]

In 1837 the Legislature of Ohio authorized the loan of the State's credit to railway companies, and subscriptions by the State to the capital stock of canal and turnpike companies, without any limitation. This was in response to a popular clamor for internal improvements. Within the three years the law was in force, about $3,000,000 was added to the sum total of state indebtedness. Moreover, the State entered upon a rather extensive program of constructing new works by the State itself. This made possible several canals which obviously could not attract enough business to pay, and into which private capital

[2] *Ibid.*, p. 253, quoting Hawkins, in "Debates of Ohio Constitutional Convention of 1851," I, p. 481.
[3] *Ibid.*, p. 253.
[4] *Ibid.*, p. 254.

would not have gone. By 1847 the State owned 814 miles of canals. During the decade following 1837, there was so lavish an expenditure of the credit of the State that securities sold from time to time at heavy discounts, the discount at one time being 33.4 per cent. To such a low state the credit of Ohio was brought by the temporizing and weak financial policy of the Legislature and the canal commissioners, and by the early extravagance and dishonesty of sister states.[5]

Other States

After 1825 there was a mania for canal building and other public works. The results in typical States have been outlined. In addition to what happened in Pennsylvania, New York, Georgia, and Ohio, there was similar activity in Massachusetts, Maryland, Virginia, Michigan, and Indiana.

When extensive plans for internal improvements were worked out, the promoters and interested localities turned to the State governments for aid. The reasons were, that the Federal Government had been stopped from aiding internal improvements by reason of an interpretation of the Constitution that there was no authority for such activity on the part of the Federal Government. Again, private capital was not sufficiently large for all the proposals, and was unwilling to enter many of them as of doubtful economic justification. Moreover, there was a distrust of corporations, and a strong feeling that the States should furnish many services which might not be commercially profitable. Finally the credit of the State could be used in a new country to raise funds, where it would be very difficult to supply adequate security to

[5] E. L. Bogart, "The State Debt of Ohio," *Journal of Political Economy,* April, 1911, p. 257 *ff.*

the offerings of a private corporation. The result was that the State Legislatures embarked upon undertakings far beyond the requirements of the times or of the means available for financing them. Perhaps $200,000,000 was borrowed abroad for internal improvements by the outbreak of the panic of 1837.

State enterprise was a failure. In some cases the works were corruptly managed. In other cases there was extravagance without overt dishonesty. States found themselves practically unable to pay interest upon the public debt. Repudiation of indebtedness was resorted to in a number of States, notable instances being Indiana, Louisiana, Maryland, Michigan, Mississippi, and Pennsylvania. Financial failure resulting from overzeal and poor management led to a revision of public opinion and a demand that the works be sold to private investors. State constitutions after 1845 usually included provisions forbidding the use of the State's credit or funds for internal improvements. All these consequences of the failure of State enterprise came during the first quarter century of railway construction. In view of these experiences American people declined to build and operate extensive railway systems as government projects. Private ownership and operation of American railroads was an inevitable result of the American experiences with state ownership and operation of canals and other public works prior to 1850.

CHAPTER XVI

THE UNITED STATES

The Fair of the Iron Horse in Baltimore in 1927 commemorated the one hundredth anniversary of the beginnings of railway transportation in the United States. The material and social progress within the country during the past century has been amazing. Without railroads this unprecedented development would have been impossible.

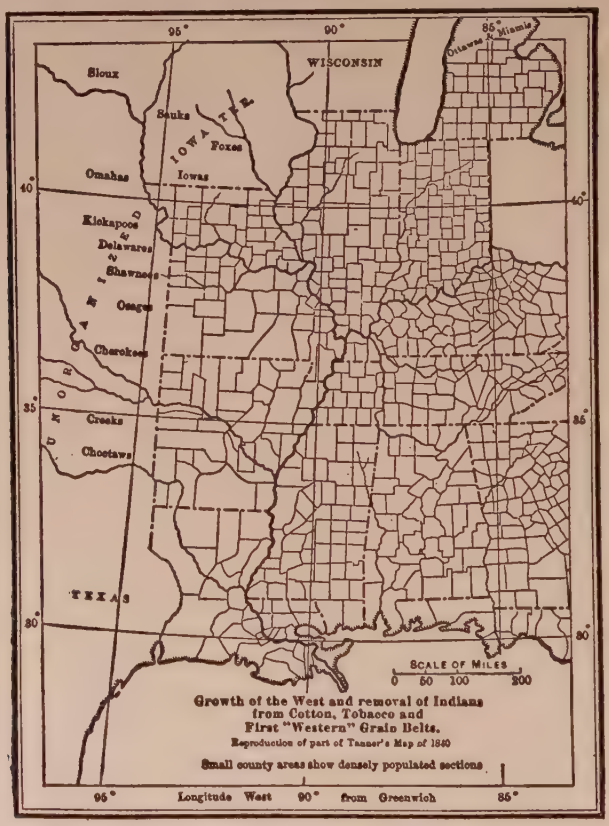
Early in the nineteenth century the invention of the steamboat converted the rivers and inland waterways into arteries of commerce. With the rush of settlers to the new frontiers made accessible by water transportation, there came a demand for more waterways and better highways. The Federal and State governments joined private enterprise and expended millions of dollars upon turnpikes and canals. All of this activity led to the removal of Indians beyond the Mississippi and whetted the appetites of frontiersmen for more territory—even for Texas, Oregon, the stretches beyond the Missouri, though all believed that Jefferson was correct when he prophesied that it would require a thousand years to settle and completely occupy the land east of the Mississippi. Land hungry pioneers idolized bold leaders such as Jackson, Benton, and Cass. Jackson promised to remove the Indians and open up fertile territory to settlement. The people of the West helped to make him President. Andrew Jackson, affectionately called the General by loyal Western supporters, left the frontier State of Tennessee to be-

gin his remarkable administration as President, just as railroads began to attract the attention of practical men. What was accomplished through the removal of Indians

Dodd, W. E.: *Expansion and Conflict,* Houghton Mifflin Co.

under Jackson's régime may be seen by comparing the accompanying maps. The steamboat, the canal, and the turnpike had made it possible for population to occupy the river valleys and the fertile areas adjacent to the Gulf and the Great Lakes. Slavery and continued immigration from western Europe promised a satisfactory supply

of laborers. The Atlantic seaboard and foreign markets called for tobacco, cotton, and grain. The Indian lands would produce these crops.

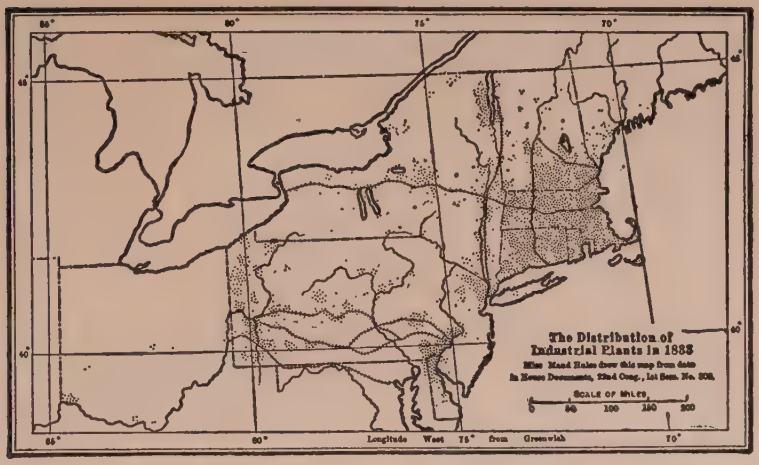


Dodd, W. E.: *Expansion and Conflict,* Houghton Mifflin Co.

The industrial revolution was making progress in the United States. Industrial plants had pretty well covered New England, and were to be found in considerable numbers in New York and Pennsylvania and there were the beginnings of manufacturing in Ohio. The commercial

and industrial Northeast wanted enlarged markets for the merchandise they imported and manufactured. Moreover they needed the coal of Pennsylvania and other localities for their factories, for the steamboats on the rivers, and for the furnaces in their homes.

Boston, New York, Philadelphia, and Baltimore were rival seaports. Each city sought to enlarge its trade terri-



Dodd, W. E.: *Expansion and Conflict,* Houghton Mifflin Co.

tory to the West. Through the completion of the Erie Canal in 1825 New York gained access to all the area about the Great Lakes. Philadelphia with liberal aid from the State of Pennsylvania pushed canals westward, aiming at a connection with the Ohio at Pittsburgh. But mountain barriers made inconvenient and rather expensive portages necessary. Topographical conditions were even less kind to Baltimore, while Boston was completely blocked by mountains in any effort to reach the West with a canal. South Atlantic and Gulf ports were ambi-

tious to develop the back country. Steamboats on the Mississippi and its tributaries made New Orleans the envy of other cities.

In the midst of this eager rivalry of coast cities to extend their trade territory, the practicability of railway transportation was demonstrated. Several years were consumed in experimentation with the new mode of transportation. It was believed at first that railroads would serve merely to supplement the waterways. The first railroads were detached enterprises planned to serve local needs. They were designed to connect waterways or cities and to enlarge the trade territory of a given city. Massachusetts, New York, and Pennsylvania were the leading industrial and commercial States. By 1830, they had provided themselves with the best turnpikes and canals—moreover, New England capital furnished a merchant marine that attracted world-wide attention, and brought profits to the shipowners. These States took the lead in railway building. By 1840 there were 2800 miles of railroad in the country, about one-half of the total mileage being in the three States of Massachusetts, New York and Pennsylvania.

During the ten years following 1840 railway building was most rapid in New York and New England, especially Massachusetts. By 1850 the total mileage of the country had reached 9000. Through routes had been established between Albany and Buffalo and Albany and Boston. By rail connection Boston had reached the Great Lakes. In 1846 the Pennsylvania Railroad was chartered to build a line from Harrisburg to Pittsburgh, thus giving Philadelphia the dreamed-of connection with the Ohio. Railroads had been built from Charleston and Savannah into Georgia, thence to Chattanooga. New York had rail and water connection with Chicago.

By 1850 the superiority of the railroad over the canal had been demonstrated. While one line of railroad had been completed by 1850 between tidewater and the great interior basins of the country, it was formed by the several links that later composed the New York Central

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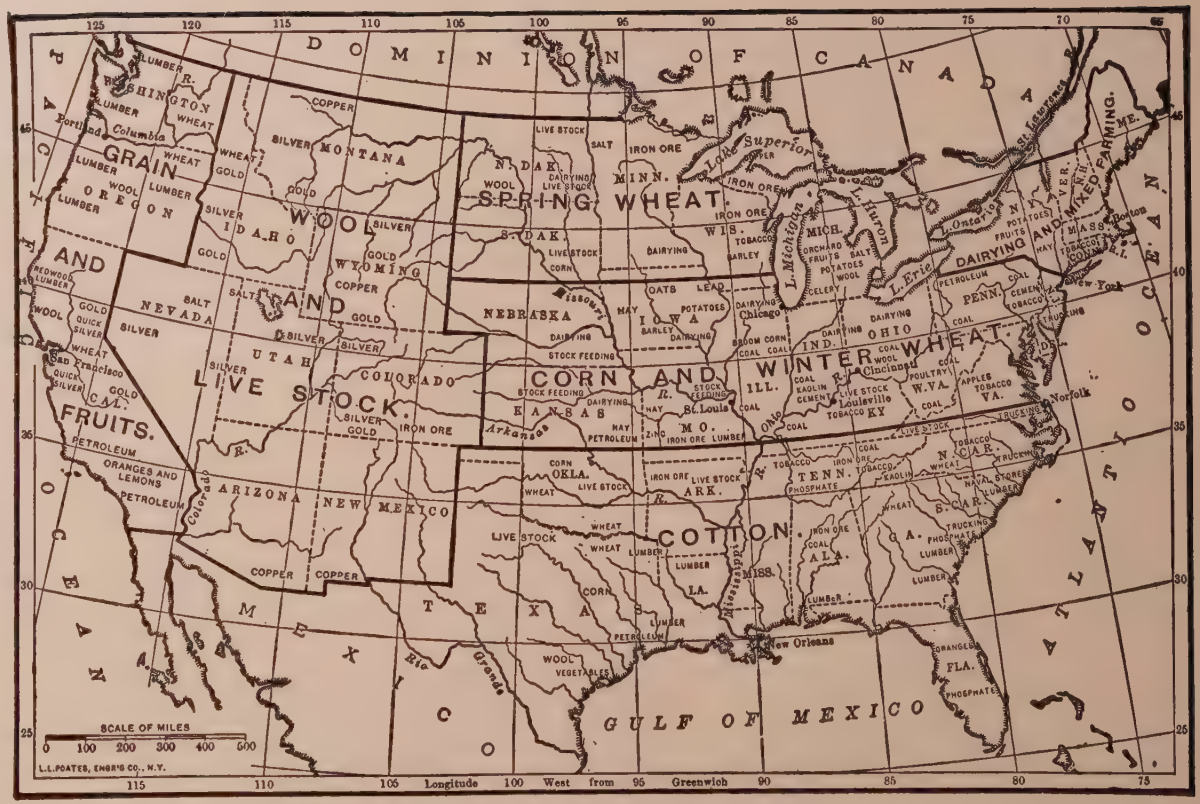
Railroad and was restricted in carrying freight except upon the payment of canal tolls in addition to the other costs of transportation. But the economies of railway transportation had become apparent, and after 1850 almost no new canal enterprises were undertaken, while several old canal projects were abandoned before completion. The nine thousand miles of railroad were made up of short local lines of varying gauges. But these first railroads had justified their existence. To build them some communities had overstrained their credit on premature projects. But with all the handicaps of novelty, crude-



Regional Distribution of Products in the United States

Bogart, E. L.: *Economic History of the United States,* Longmans, Green, and Co.

ness, and experimentation, it was seen that the railroad was superior to any other means of transportation.

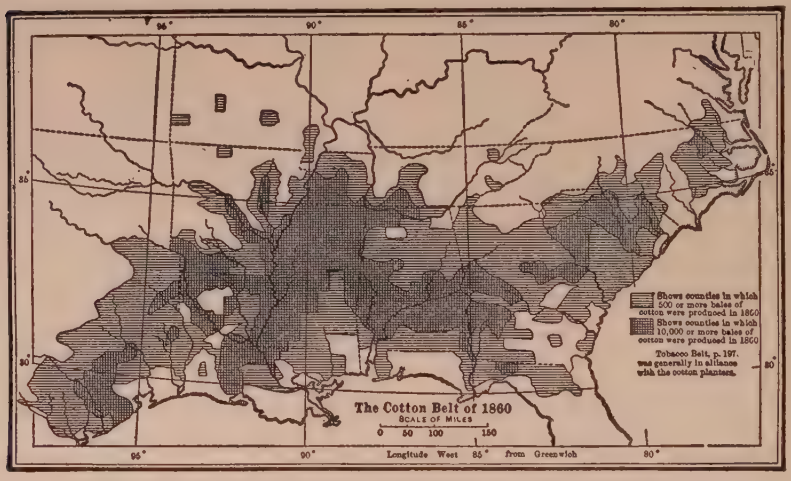
During the years of railway experimentation, the present boundaries of the continental United States had been established. Jackson removed the Indians from the good farming lands east of the Mississippi River. His successors pursued his policy of expansion and annexed Texas, settled the Oregon boundary disputes with England, and through treaties following the Mexican War acquired a vast empire including California.

The territory of the United States as defined after the foregoing accessions comprised 2,997,119 square miles. The potentialities of this vast area were beyond the powers of the human imagination to portray. In order to develop the latent resources, transportation facilities were necessary. To meet this need for transportation, the recently developed steam railroad was utilized. With the initiative, enterprise, and daring born of long contact with frontier conditions, the American people spread a network of railroads over all their far-reaching States. The laying of this railway net transformed the country into a well-populated land with every variety of economic activity. The accompanying map indicates the regional distribution of products in the United States.

One hundred million people or thereabouts are employed and maintained in producing and distributing this great variety of goods. A brief summary will serve to indicate how railroads were provided in order to accomplish this unprecedented creation of wealth and contribution to welfare.

The decade before the outbreak of the Civil War was one of the most prosperous in American history. The discovery of gold in California drew thousands of immigrants and fortune hunters to that recently acquired ter-

ritory. The long voyage around South America, or by way of the Isthmus of Panama and the long journeys across the continent emphasized the need of railroads to connect the new territory with the rest of the country. The gold and other resources exploited in California added to the wealth of the country. With waterways and turnpikes, supplemented by such railroads as were built before 1850, population had increased from about 12,000,-


95°
90°
85°
80°
35°
30°
Shows counties in which 500 or more bales of cotton were produced in 1860
Shows counties in which 10,000 or more bales of cotton were produced in 1860
Tobacco Belt, p. 197, was generally in alliance with the cotton planters.
The Cotton Belt of 1860
SCALE OF MILES
0 50 100 150
Longitude West 85° from Greenwich

Dodd, W. E.: *Expansion and Conflict,* Houghton Mifflin Co.

000 in 1830 to nearly twice that number in 1850. By 1860 another 8,000,000 souls had been added, making a total of 31,000,000. During this decade the foreign-born population more than doubled, being attracted from Western Europe to the new lands and industries of America. Such growth in population was accompanied by a most remarkable growth in material wealth and an improving standard of living.

After 1830 the planters rapidly spread their system over the lower South, reaching the Rio Grande by 1860.

The output of sugar, tobacco, and cotton doubled between 1850 and 1860, reaching an annual market value of $300,000,000.

The Northwest entered upon a period of phenomenal growth during the decade 1850-1860. The Indians were pushed out of Iowa, Wisconsin, and Minnesota. The invention of farm machinery for planting and harvesting grains so reduced the labor cost to grain farmers, as to

Tobacco Areas in 1860
SCALE OF MILES
0 50 100 200 300
Each dot represents 50,000 pounds of Tobacco harvested in 1860
Dots are located in counties of origin, except in a few instances where space was too small. In such cases extra dots were placed in neighboring counties.
Longitude West 80° from Greenwich

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enable them to enter profitably upon an agricultural activity to which slavery was not adapted and in a country where hired laborers were scarce. The value of the wheat and corn crops of North America increased from $80,000,000 in 1850 to $225,000,000 in 1860. In addition livestock were profitably grown, for the South afforded a market for pork, and the East demanded beef for the growing industrial communities. The Northwest exported $50,000,000 of grain a year. Western farmers became prosperous, as were their cotton-growing countrymen in the

rich lands of the South. They built frame houses and bought imported luxuries. This was a happy period for American farmers. The demand for such products as cotton, corn, wheat, tobacco, and sugar was almost steadily greater than the supply.

Manufacturing developed in the East before 1860 beyond all expectations. In 1830 mill products were worth

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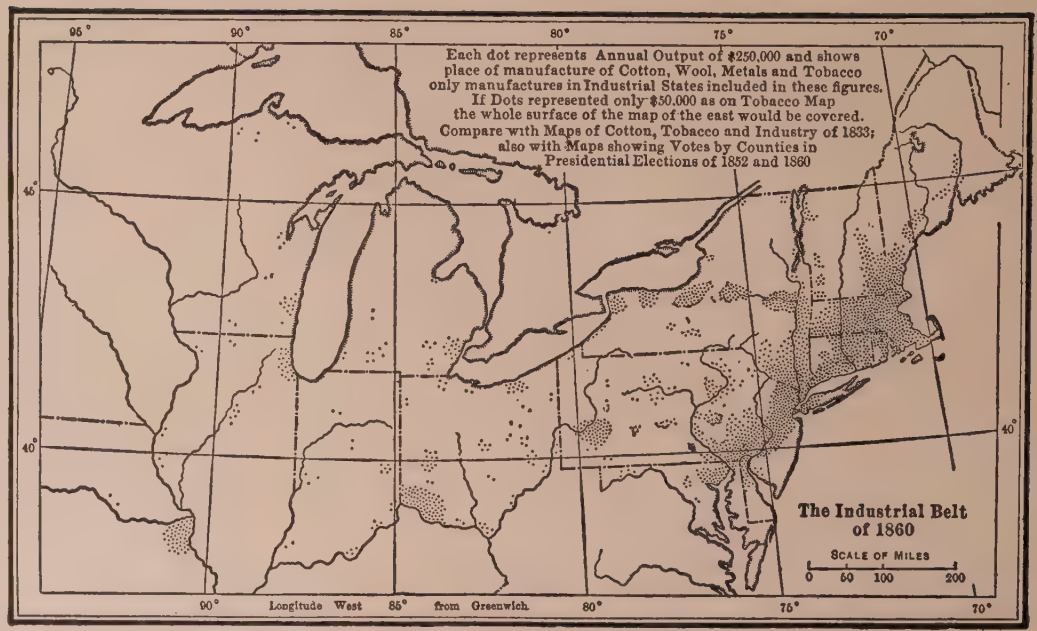
about $40,000,000. By 1860 the value of such products had risen to $330,000,000. The factories creating these immense values employed about 4,000,000 operatives. The tonnage of American shipping had increased tenfold between 1830 and 1860, reaching nearly 5,000,000 tons, yielding earnings for the owners of about $70,000,000 each year. New York had come to import three-fourths of the European goods consumed in this country, and the clearings of New York banks ran into the billions of dollars. Industry, commerce, shipping, and banking were concentrated in a relatively small area, about 200,000


95°
90°
85°
80°
75°
70°
Each dot represents Annual Output of $250,000 and shows place of manufacture of Cotton, Wool, Metals and Tobacco only manufactures in Industrial States included in these figures. If Dots represented only $50,000 as on Tobacco Map the whole surface of the map of the east would be covered. Compare with Maps of Cotton, Tobacco and Industry of 1833; also with Maps showing Votes by Counties in Presidential Elections of 1852 and 1860
45°
40°
The Industrial Belt of 1860
SCALE OF MILES
0 50 100 200
90° Longitude West 85° from Greenwich 80° 75° 70°

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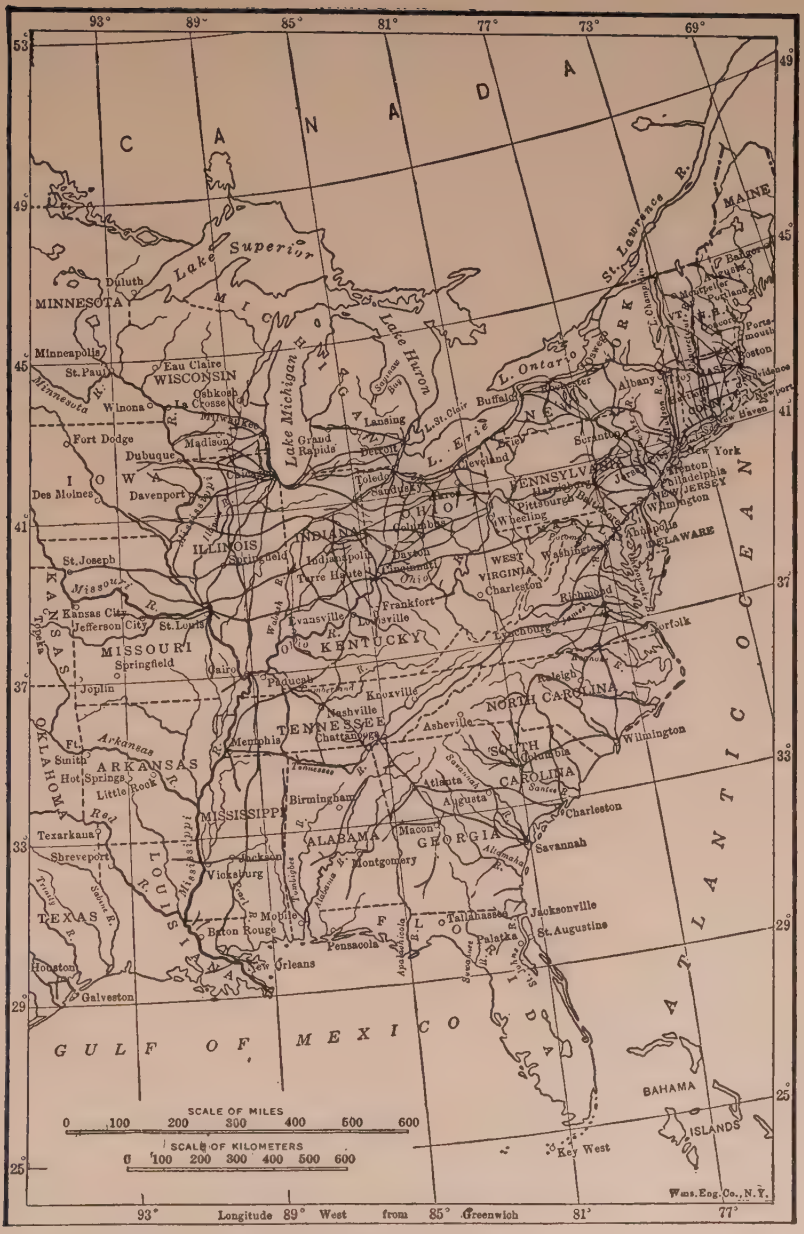
square miles, and each year earned returns almost equal to the capital invested.

This remarkable growth and prosperity would have been greatly curtailed but for railroads. During the decade ending 1860, railroads were built to the extent of 22,000 miles and at a cost of about $850,000,000. This brought the total railway mileage up to 30,600 and the total investment in railroads to about $1,100,000,000. During the decade great progress was made in combining local lines into through systems. One can consult the foregoing maps showing agricultural and industrial growth and tell pretty well where the railroads were built. The greatest amount of building during the ten years preceding the Civil War was in Illinois, Ohio, and Indiana, these three States accounting for about one-third of the total construction. There was also continued activity in New York and Pennsylvania. The State of Georgia built the Western and Atlantic from Chattanooga to Atlanta, calling the latter place into being as the gateway of the middle West to the eastern cotton belt. The Baltimore & Ohio reached Wheeling in 1852, and in that year the line from Harrisburg to Pittsburgh was completed. The first through train involving no transfer of passengers moved from Philadelphia to Pittsburgh in 1858. A second line was built between Buffalo and Cleveland. Chicago was connected with the Mississippi River and the Mississippi was also connected with the Missouri. In 1856 the Illinois Central had been built from Chicago to Cairo, there connecting with the Mobile & Ohio. In 1858 Chicago had rail connection with Pittsburgh.

During the years preceding the Civil War it was definitely decided that American railroads should be owned and operated by private corporations. After 1850, private capital was forthcoming in sufficient amounts to make



After MacGill, History of Transportation in the United States before 1860 [Carnegie Institution].

Railroads in the United States in Operation in 1860

state ownership unnecessary. It was demonstrated beyond question that railroads could be privately operated with greatest efficiency and with profit to the owners. States ceased writing into charters of railway companies provisions under which the railway properties might be acquired by state governments. Gradually the States withdrew from the railway business, until by 1857 every State except Georgia and Virginia had disposed of its railroads to private companies. The States and municipalities had from the first aided railroads through purchase of stocks and bonds, through donations of cash and securities, through loans and tax exemptions, and through granting special privileges. During the decade after 1850 more than three-quarters of a billion dollars was invested in railway enterprises. The most of this was by private capitalists, $450,000,000 having been borrowed from European investors. State and municipal aid was continued through the decade to 1860 particularly in the Northwest and the South. Under the leadership of Senator Douglas of Illinois, the Federal Government donated 20,000,000 acres of land to the States, which in turn granted it to railroads. These land grants were of great assistance in establishing the credit necessary to the construction of the Illinois Central and the Mobile & Ohio; but as can be readily seen the value of the land constituted a relatively small percentage of the sums required to build 7500 miles of new line in the Northwest and 5000 miles in the South.

There was urgent demand to bind the Far West to the rest of the country. During the administration of President Pierce, his Secretary of War, Jefferson Davis, surveyed three transcontinental routes to the Pacific coast. One route was from Chicago, and had the support of Douglas and the Northwest; a second route was from St.

Louis and was favored by Benton and those of the Middle West; the third route was from Memphis across Texas and along the Mexican border to California. This third proposal evidently had the support of the administration and of the South. James Gadsden, an able railway president of South Carolina, was sent to Mexico to purchase a considerable strip of land along the southern border of New Mexico so as to make possible an easier southern route for a railroad, and one less obstructed by mountain barriers. Mr. Gadsden was quite successful and acquired 29,670 square miles for $10,000,000, which has since been known as the "Gadsden Purchase." Constitutional authority for building a Pacific railroad was deduced from the "War Power" of the Federal Government. Texas was lending a portion of the $10,000,000 received in the Omnibus Compromise to assist railway construction, and by 1860 nearly 500 miles had been constructed reaching from Houston into the interior in several directions and to the Louisiana border toward New Orleans. With the construction of the Southern route, New Orleans would become of more importance as a port, and Houston and Galveston would aspire to rival New Orleans. Railroads would be built to the north and the northwest from connections on the main line, and thus bring the entire Southwest and most of the Middle West to face the Gulf ports; perhaps the grain of the Northwest would to considerable extent be routed through these ports. In any event topography favored such a development, for grades are easy from Colorado, Nebraska, and Kansas toward the Gulf. Many rivers in the region flow in a southeasterly direction, the winters are mild, and expenses of railway operation, therefore, reasonable, and the Gulf ports are never ice bound in winter.

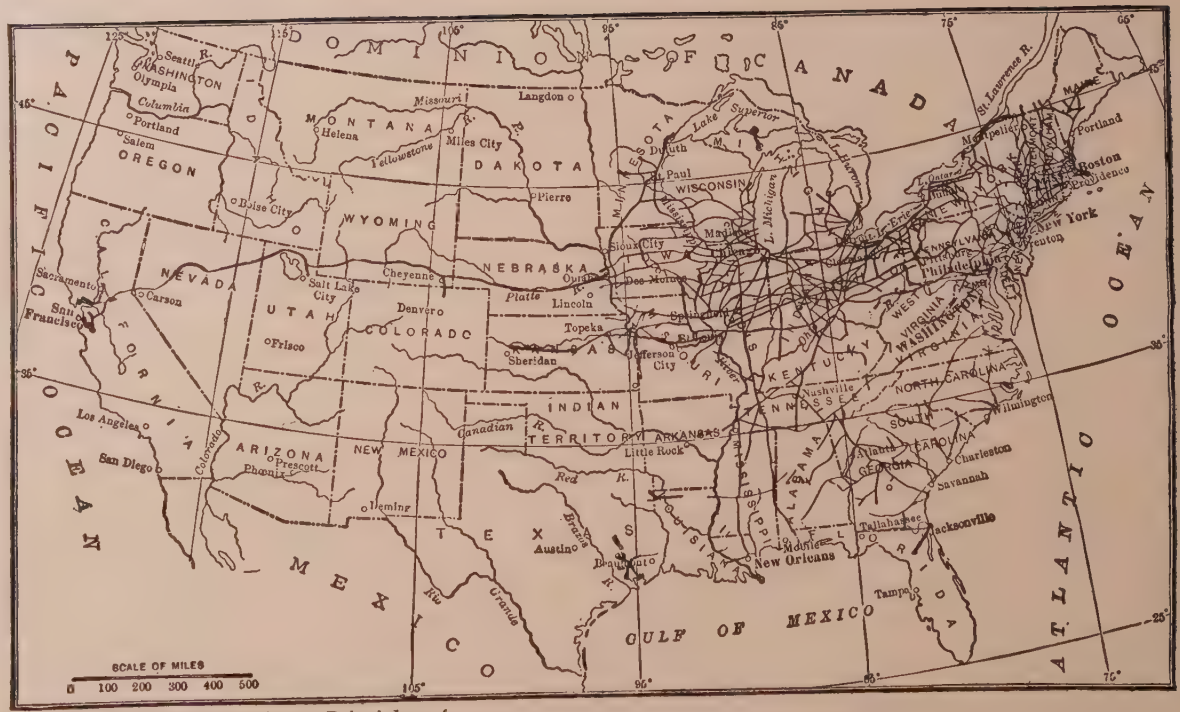
But the Northwest and Middle West sensed danger to

the ambitions of Chicago and St. Louis in the administration's program. Moreover, the East feared that slavery would follow along this route to the West and along its branches toward the North and Northwest. The result was a deadlock that continued until the Civil War. After the withdrawal of the Southern senators and representatives from Congress, and after the prestige of Douglas had received a blow through the division of his own party and the consequent election of Lincoln, Congress in 1862 passed an Act to aid in the construction of a railroad to the Pacific along the middle route, authority being given to build the Union Pacific from Nebraska to the western boundary of Nevada, where it was to meet the Central Pacific chartered in California in 1861. The Federal Government gave the Union Pacific about 12,000,000 acres of land, and the Central Pacific about 10,000,000 acres. In order to obtain capital with which to carry on construction each road was authorized to sell United States Government six per cent bonds to an amount varying from $16,000 per mile for the level stretches up to $48,000 per mile for the mountainous portions. Under these provisions the two companies together received something over $27,000,000 of government bonds. In the end the Government took a second lien on the companies' properties so as to enable them to issue first mortgage bonds to the investing public.

There followed large land grants to other railroads and proposed lines. In 1864 a large grant was made to the Northern Pacific which was chartered by Congress to build from Lake Superior to Puget Sound. In 1866 a large grant was given a company, now a part of the Santa Fé, to encourage the construction of a line from Missouri to California along the route of the old Santa Fé Trail. The Southern Pacific chartered in California in 1865 received

grants to enable it to build eastward. A final congressional grant was made in 1871 to encourage building a railroad from New Orleans to Southern California. The Southern Pacific and the Texas and Pacific were the principal beneficiaries under this grant. Between 1850 and 1871 the Federal Government offered the railroads more than 150,000,000 acres of public lands.

The Civil War had the effect of slowing down railway building for a time. Reference to the map showing the railway mileage of the country in 1860, enables one to understand how Lincoln was able to maintain his policy of preserving the Union in the face of indifference among his influential Eastern constituents. Railroads built during the fifties definitely bound the Northwest to the East. The Northwest had obtained outlets to the great Atlantic seaports through the building of railroads. These roads had been constructed with the encouragement of Federal land grants. The Northwest wanted a strong Federal Government. Moreover, their prosperity lay in growing and marketing livestock and grain. Slavery was not adapted to those activities. Not needing slaves for labor, but relying rather upon farm machinery, they were largely indifferent or opposed to slavery as an institution. They had furnished the country with an anti-slavery President instead of Douglas, who had done so much to lay the basis of their material prosperity; and they gave to Lincoln the soldiers, the moral support, and much of the basis of prosperity for the entire North which enabled him to win. For example, while the South was blockaded and cotton could not move from her ports, there were crop failures in western Europe creating an unusual demand for breadstuffs. The country exported wheat to the value that the cotton exports had been. The grain was available for export because of the developing Northwest,



From Johnson and Van Metre, Principles of Railroad Transportation [*D. Appleton & Co.*].

Map of the United States Showing Railroads in 1870

and that development was dependent upon rail transportation. If the Civil War could have been postponed another decade, it probably would never have occurred, for the different sections of the country would have been brought into such economic and social relationships as to have prevented a breaking up of the Union.

By 1870 the total mileage had reached 53,000. During the Civil War and the years following there was a continued combination of end-to-end lines. Moreover, there were a number of improvements, such as the introduction of steel rails, the substitution of iron bridges for wooden bridges, the use of Pullman cars, and the successful operation of air brakes on passenger trains.

Construction continued at a rapid pace for a quarter century after the Civil War. The main trunk lines were being laid, and branches necessary to rounding out systems in the more densely populated sections were being provided. By 1880 the mileage had reached a total of 93,000 miles and in 1890 the total was 163,000 miles. Nearly 13,000 miles were built in the single year 1887. During the seventies, Illinois, Iowa, Texas, Michigan, Ohio, Minnesota, and New York led in railway building. During the eighties, construction was greatest in Kansas and Texas, and was notable in Nebraska and Michigan. The great transcontinental lines had been laid out and began operation as through roads:

The Santa Fé in 1881; the Southern Pacific in 1882; the Oregon Short Line with the Union Pacific in 1884; the Canadian Pacific in 1885; the Santa Fé reached Chicago in 1888; the Santa Fé reached San Francisco in 1893; the Great Northern was completed into Seattle in 1893.

Improvements after 1870 went along quite rapidly. There was extension of the standard gauge; the applica-

From Johnson and Van Metre, Principles of Railroad Transportation [D. Appleton & Co.].

Map of the United States Showing Railroads in 1890

tion of the air brake to freight trains; the rapid substitution of steel rails for iron rails; the introduction of bigger locomotives and cars; the groupings of various lines; and the introduction of safety appliances. In fact improvements went along at such a pace that the country became accustomed to improving service combined with low and falling rates.

Obviously many railroads were built ahead of the traffic. There was undue optimism in some cases as to the amount of tonnage a given territory would yield after a certain period. Such miscalulations led to the financial failure of a number of important lines. Over-investment in railroads contributed to the panics of 1873 and 1893. There followed the severe panic of 1893 several years of depression and slow recovery. About 1898 the country entered upon a period of industrial activity and prosperity comparable to the decade preceding the Civil War. By 1907 tonnage had increased until the railroads could hardly handle it. By 1900 railway mileage had reached 193,000. Since then the annual increase has been, on an average, about 2200 miles. However the average between 1900 and 1914 was about 4500 miles. Among the notable lines built after 1900 were those from Salt Lake to Los Angeles in 1905; from Salt Lake to San Francisco in 1909; and the St. Paul from Chicago to Seattle, also completed in 1909. There has been relatively little new mileage built since the outbreak of the World War. But existing mileage has been tremendously improved during the past ten years. Thousands of miles of dilapidated roadbed have been changed into excellent railway tracks. Grades have been reduced, curves have been eliminated, light rails have been replaced with heavier rails making possible much heavier and longer trains. The most of these improvements have been necessary in order to utilize the

revolutionary improvement of the locomotive. The Federal Government in 1923 completed 500 miles of line in Alaska.

For many years the public regarded the railroads as being competitive undertakings. It was assumed that competition would regulate the rail carriers in the public interest. At first the short and isolated railroads were in competition with transportation on the turnpikes, and more especially with the waterways. After railway transportation was improved and systems came to serve far distant localities and to traverse several States, it was seen that unregulated competition between railroads might not be in the interest of the public. However, long after the quasi monopolistic character of railroads was evident, there was determined effort through state regulation to force a maximum of competition.

Ohio and Massachusetts created commissions in 1867 and 1869. The prevention of accidents, the gathering of statistics, and the observance by railroads of the restrictions imposed by their charters, were the chief objectives of the early commissions.

After 1870 there was a change in the attitude of the public toward railroads. It is human nature to overvalue the novel and to lay undue emphasis upon the benefits to be obtained from a promising innovation. It is also human to take for granted, if not to find fault with, the same device after it has ceased to be novel and its possession is secure. After railroads had been built ahead of the traffic, people were encouraged to settle the lands made accessible through railway construction. Many moved out on to such lands without adequate capital. Crop failures and poor markets were ruinous to thousands of families. They were in the same position as some of the railroads on which they depended, they had discounted the future

too heavily. When crops were good, the prices were apt to be poor from overproduction. When prices were good, crops in the new territories were apt to be poor. Out of discontent among the farmers of the West there arose a series of rather drastic laws passed by different state Legislatures to regulate the railroads. These were known as the Granger laws. While the most strict of them were either repealed or declared unconstitutional, the courts held that the States had the right to regulate the rates railroads might charge and to subject carriers to state supervision in other particulars as well. There were abuses by the railroads especially in the matter of discrimination. A few unscrupulous financiers looted a few important railway companies. Their depredations received the widest publicity. Railway managements were often tactless and too frequently obstinate. The reaction of the public was a demand for supervision. After the States found that they had the power to regulate the railroads, the Supreme Court announced the right of a court to review an order of a state regulatory body. The court said: "The question of the reasonableness of a rate of charge for transportation by a railroad company, involving as it does the element of reasonableness both as regards the company and as regards the public, is eminently a question for judicial investigation requiring due process of law for its determination. If the company is deprived of the power of charging reasonable rates for the use of its property, and such deprivation takes place in the absence of an investigation by judicial machinery, it is deprived of the lawful use of its property, and thus, in substance and effect, of the property itself, without due process of law and in violation of the constitution of the United States" (The Chicago, Milwaukee & St. Paul Railway Company v. Minnesota, 134 U. S., 458).

In 1886 the Supreme Court held that a state Commission had no jurisdiction to regulate rates on an interstate movement from another State (118 U. S. 557). Since the larger proportion of freight moves interstate, there was no way to regulate such movements except under Federal legislation. Moreover, it was found that railroads had over-built between the Atlantic and the Great Lakes and the Mississippi River during the seventies. There was not enough business to support all of the existing lines.

The West had not caught up in its development with its railway construction. Cutthroat competition between railroads threatened them with complete ruin. Shippers played one road off against another. In the scramble for business all sorts of unfair practices developed. In order to stabilize the situation, the railway companies sought to make agreements as to rates. But some eager traffic man would disregard the agreement and another general scramble for business would follow. The roads during the eighties pooled their traffic or earnings. Pooling was naturally unpopular with many shippers and with the public at large, since it meant stabilized rates and higher rates than were charged under the abnormal condition of cutthroat competition. Then, too, there was the possibility of unreasonably high rates. The result was the Act to Regulate Commerce passed by Congress in 1887, creating the Interstate Commerce Commission. This act was especially aimed against discrimination and pooling. That is, it sought to assure competition between the railroads and to regulate the roads so that competition would bring the maximum benefits to shippers without throwing the carriers into bankruptcy.

For several years the Interstate Commerce Commission was uncertain of its power. Seven years were required to establish its authority to compel witnesses to testify. It

had no power to enforce its orders. An order had to be obtained from a court to enjoin obedience of a railroad to an order of the Commission. The courts refused to accept as final the evidence taken by the Commission. Since the courts would reopen a case, the carriers yielded to the temptation to reserve their testimony for the courts, rather slighting the Commission. In 1897 the Supreme Court held that the Commission did not have the power to make an order specifying maximum rates which a railroad might charge in the future (167 U. S., 479). In the language of one of the Supreme Court justices this decision almost rendered the Commission a useless body.

It was obvious that if the purposes of Congress were to be achieved and the railroads brought under effective regulation, the Act to Regulate Commerce would have to be amended. Then, too, the anti-pooling provisions of the Act, and the Sherman Anti-Trust Act, had had the effect of bringing about the combination of several companies under the ownership or direction of one company. The public became nervous over this situation, and the public nerves were rather steadily irritated by certain politicians who professed to see grave dangers in the mere size of railway systems. There was more uneasiness in Congress perhaps by reason of interlocking directorates than from the size of systems. An investigation in 1905 revealed that a majority of the board of directors of practically every railroad east of the Mississippi could be made up from a list of twenty-nine persons. E. H. Harriman had gained control of the Union Pacific and the Southern Pacific and boldly proclaimed that if it were not for the Sherman Act he would also acquire the Santa Fé, the Northern Pacific, and the Great Northern. The public felt that there was real cause for alarm in such a situation.

The people did not want competition completely extinguished. The advance in freight rates after 1899 also gave impetus to new legislation. The railway officials argued that combinations were less apt to indulge in discrimination than weaker competing lines. They also contended that the increased freight rates had been necessary to furnish a basis of credit, which was necessary to improve and extend the railway net to where it would adequately serve the transportation needs of the country.

Congress proceeded to pass several important amendments to the Act to Regulate Commerce. In 1903 the Expedition Act called upon Circuit Courts of the United States to give precedence to, and to expedite in every way, suits in equity arising under the Interstate Commerce and Anti-Trust Acts. The Elkins Act of the same year was designed to prevent entirely discrimination between persons. The Elkins Act made the published tariff the standard of lawfulness. Railway corporations as well as their officers and agents were made liable for violations of the interstate commerce acts. The shippers receiving rebates as well as the railroads granting them, were subjected to the penalties of the law. And the courts were given jurisdiction to enjoin violations of the law.

The Hepburn Act of 1906 gave the Commission power to prescribe maximum rates for the future in place of rates found to be unreasonable or discriminatory. This act further provided that detailed annual reports to be rendered by all common carriers should be under oath and be filed with the Commission three months after the close of the year to which they apply. It also prescribed a uniform system of accounting and forbade the railroads to keep any accounts or records not authorized by the Commission.

In 1910 the Mann-Elkins Act further added to the

powers of the Commission. Among other things this Act clothed the Commission with power to suspend a proposed change in rates; it was made illegal for carriers to charge more for shorter hauls than for the longer, unless they were authorized to do so by the Commission; the Commission could hold a hearing on its own motion; it was given power over the classification of freight; shippers were given the right to designate by which of two or more routes their freight was to be carried to destination; common carriers and their agents were forbidden to disclose any information concerning the route, the destination, or the consignee of any shipment when such information might be used to the detriment of the shipper.

The Panama Canal Act of 1912 gave the Commission general authority over the relations between rail and water carriers.

Under the Valuation Act of 1913 the Commission was directed to ascertain the value of all the property owned or used by common carriers. The main purpose of this act was to furnish the Commission with some standard by which to test the reasonableness of railway rates and the reasonableness of proposed changes in rates.

The Esch-Cummins Act of 1920 commonly known as the Transportation Act of 1920, added to the powers of the Interstate Commerce Commission and effected the return of the railway properties to their owners after a little more than two years' operation by the Federal Government as a war measure. The most important provisions of the Act of 1920 were as follows:

The Interstate Commerce Commission was given exclusive jurisdiction over the issuing of securities by railway corporations, and was empowered to grant or deny an application in whole or in part, and to attach to its approval such terms and conditions as it considered neces-

sary and appropriate. This provision really rendered somewhat unnecessary the valuation called for under the valuation Act of 1913. However, the valuation provisions were retained in the law of 1920, and efforts were made to define some of the uses to which the general valuation might be applied.

There was the provision for a division between the railroads and the Government of earnings above six per cent on the valuation to be fixed by the Commission. The administration of the so-called recapture clause, though its legality was sustained by the Supreme Court (Dayton-Goose Creek R. Co. v. United States, 263 U. S. 456), has not been very successful, and there is a demand on the part of shippers for its repeal (Resolution by National Industrial Traffic League, 1927).

The Act called upon the Commission to prepare a final plan under which the railroads of the entire country might be consolidated into a limited number of systems. After extensive hearings and prolonged deliberations, the Commission decided that the preparation of such a plan was impractical and for three consecutive years it has asked Congress to modify this provision of the law so as to relieve it of the responsibility of trying to formulate such a plan. Under other provisions of the Act, the Commission seems to be authorized to approve applications for grouping different railroads through lease or stock ownership, so as to bring them under one management. While there has been some difference of opinion among the members of the Commission as to the authority conferred upon the Commission under these provisions, gradual and permissive consolidations have gone forward with orders from the Commission approving such groupings as being in the public interest. Moreover, the anti-pooling section of the Act of 1887 was modified in 1920

to authorize the railroads to pool their freight or earnings after having obtained the approval of the Commission.

The Commission was given large powers over service. In order to build a new line, to extend a line, or to abandon any portion of a railroad, the company must obtain from the Commission a certificate of public convenience and necessity. This was designed to prevent economic waste through the construction of lines not needed to handle the tonnage which might reasonably be expected to develop. The Commission may compel railroads to provide themselves with safe and adequate facilities for performing their car service. The Commission may order the use of the terminal facilities of one railroad by another. The Commission may also make such directions with respect to the routing of traffic, offered a railroad, over such other roads as may best promote service and commerce. Whenever a shortage of equipment, congestion of traffic, or other emergency exists, demanding in the opinion of the Commission immediate action, the Commission is authorized, at once, without notice or hearing: (1) to suspend all rules and regulations with respect to car service; (2) to make such directions with respect to car service, without regard to the ownership of locomotives or cars, as will, in its opinion, during the emergency, best promote the service in the interest of the public; (3) to require such joint or common use of terminals and of main line tracks for a reasonable distance outside of the terminals, as will best meet the emergency; (4) to give directions for preference or priority in transportation, embargoes, or movement of traffic under permits for such periods and at such time as it may deem wise. These provisions of the law, empowering the Commission to regulate car service to prevent congestion and car shortages, have been rendered relatively a dead letter by the

remarkable performance of the carriers in enlisting cooperation between themselves and the shippers.

The power of the Commission over rates, already great, was increased. The rule of rate making laid down by the law required the Commission to initiate and establish rates under which the carriers as a whole (or as a whole in each of such rate groups as the Commission may from time to time designate) will, under honest, efficient, and economical management, and under reasonable expenditures for maintenance, earn a fair aggregate annual net return upon the aggregate value of the railway property of such carriers used in the service of transportation. The Commission shall from time to time determine and publish the percentage of such aggregate property value that constitutes a fair return thereon, and this percentage shall be uniform for all the rate groups that may be designated by the Commission. Obviously this rule does not constitute a guarantee for individual railroads. The Commission was empowered to fix minimum as well as maximum rates. In a time of industrial depression, this provision is calculated to prevent rate wars and to protect the public against the consequences of cutthroat competition among the carriers.

There were provisions requiring that in the administration of the long and short haul clause, the Commission should establish rates that would be reasonably compensatory and equitable.

The Commission was definitely given jurisdiction over intrastate rates so as to prevent, among other things, any unreasonable discrimination against interstate or foreign commerce.

The Act recognized the necessity of uninterrupted service on the railroads. While it did not outlaw strikes and lockouts, it called upon railway executives and em-

ployee representatives to settle their disputes, if possible, in conference. In the event of failure of agreement in efforts at collective bargaining, the differences were to be referred to Boards of Labor Adjustment which were authorized, or to a Railroad Labor Board which was created. The Railroad Labor Board had nine members all appointed by the President. Three members were chosen from the country at large, three from a list furnished by railway executives, and three from a list furnished by employee representatives. After certain increases in wages during the first few months of its existence, the Railroad Labor Board faced the thankless task of adjusting wages during a period of falling prices. After a few months the members of the Board chosen from the management and employee groups seem to have become rather partisan, thus throwing undue burdens upon the three members representing the public at large, and furnishing the country with the spectacle of a constantly divided and wrangling Board. In 1925 under the Watson-Parker amendment to the Act, the Railroad Labor Board was superseded by a Mediation Board of five members, all of whom are appointed by the President from the country at large. In the event that the Board fails in efforts at mediation it may seek to bring about arbitration of particular disputes. From August 9, 1926, when the Board actually began to function, up to May 1, 1928, it had received 351 major applications for services of the Board in mediation. Of this total, on May 1, 1928, 237 cases had been adjusted. Of these 133 were settled by mediation; 40 by arbitration; 59 had been withdrawn through mediation or by voluntary action of the parties, and 5 were closed by action of the Board for lack of jurisdiction. In only one case had it become necessary for the Board of Mediation to notify the President of the United States of an emergency situ-

ation which called into operation Section 10 of the law and resulted in the creation of an Emergency Board. In addition to the foregoing the Board has received some 103 applications for services in grievance matters of lesser import usually involving the interest of a single employee. In these latter cases services have not as yet been extended, pending action of carriers and their employees in creating adjustment boards under the law and also pending the formulation of a policy on the part of the Board of Mediation with respect to the handling of these grievance matters.

The Mediation Board was fortunate in being able to begin its labors in a period of relative quiet, and when there was a fair degree of prosperity, particularly in the older and more highly developed portions of the country.

This brief survey has served to show how during the past one hundred years, the most conspicuous economic achievements in the United States have depended directly upon transportation and most of all upon railway transportation. By means of the railroads the vast areas of the continental United States have been joined together, have been traversed again and again, have been opened up to settlement and occupied. By reason of excellent transportation facilities the United States has achieved an almost complete monopoly of the world's cotton market; has participated largely and profitably in international trade in food products, has led the world in steel and allied industries, bringing together at small cost, at strategic points, raw materials separated by hundreds of miles; and has developed a territorial division of labor which forms the basis of a stupendous internal commerce. Some seventy-five years ago the American people definitely abandoned government ownership of railroads and in chartering railway companies deliberately refused

to contemplate such a possibility. In developing a serviceable railway system, private ownership has come to be subjected to rather close supervision and regulation by both State and Federal governments. The ultimate character and the final extent of such regulation has not yet been determined. Experimentation goes forward. Modifications and new adjustments in regulatory laws and machinery are being worked out from time to time. There have been, and there continue to be, minorities who contend for government ownership of railroads. In view of such contentions, before this survey of the experience in owning and operating railroads in different countries is concluded, a brief summary should be made, first of government operation of the railroads in the United States during the World War, and, second, of what has transpired since the railroads were returned to their owners in 1920.

CHAPTER XVII

THE PERIOD OF GOVERNMENT OPERATION IN THE UNITED STATES

After the enactment of the Hepburn bill of 1906, giving the Commission control over maximum rates, it became difficult in a period of rising prices and increasing expenses for the railroads to obtain authority to charge enough for their services to meet current operating expenses, and afford a basis of credit for necessary and desirable enlargements and betterments.

Under private ownership and management the American railroads had up to 1906 furnished the country with transportation usually adequate for handling existing business and frequently built ahead of the traffic in anticipation of new developments. During the decade preceding the entrance of the United States in the World War, the Interstate Commerce Commission, with its great powers over rates, had been driven by a misinformed and powerful public opinion to adopt a policy of negation that had crippled American railway credit, and driven insurance companies, savings banks, and other careful investors to look askance upon offerings of railway securities.

For ten years the railroads had found it increasingly difficult to finance current operations, much less expansions called for by the growth of the country. By 1915 forty-two thousand miles of railroad had passed into receivership including a number of large and important

systems. Moreover, lack of revenues kept the managements from increasing wages comparable to advances in other industries, thus weakening the morale of the employees. It was a decade of railway baiting. Politicians climbed to eminent positions through their abuse of railway corporations. Again and again the most glaring falsehoods were proclaimed and published. It did not seem to matter that the published reports of the Interstate Commerce Commission refuted the reckless claims that railroads were concealing large earnings; very few read the reports, and the majority seemed to accept the generalities of the demagogue. The result was that America entered the World War with impaired railway credit, a system that had not been permitted to develop to where it could adequately carry a peak load, with discontented employees, discouraged managements, and impatient shippers.

After the declaration of war, the railway executives immediately organized the Railroads War Board. This Board initiated coöperation and improvements in service in many forms, some of which the carriers had been powerless to realize under the inhibitions of anti-pooling and anti-trust laws, and which they could not lawfully carry out even in war time.

By December, 1917, the Commission recommended to Congress that the railroads should be enabled to effect unification (which had been sought by the Railroads War Board) in a lawful way by the suspension, during the period of the War, of the operation of the anti-trust laws, except in respect of actual consolidations and mergers, and of the anti-pool provisions of the commerce act. Further, that the railroads should be provided from the government treasury with financial assistance in the form of loans or advances for capital purposes.

On December 26, 1917, the President of the United States under powers with which he had been clothed in 1916 (appropriation bill of 1916 gave the President power to take over railroads as a war measure) took possession of the railroads as a war measure. Under legislation which followed (Federal Control Act, March 21, 1918) the railroads were guaranteed a return during Federal control equal each year to the average of the three years immediately preceding June 30, 1917.

In working out the details of contracts between the Government and individual railroads under the provisions of the Federal control act, the Government had every advantage. The carriers could not enter into any controversies over terms with the Director General. For example, section three of the contract specifically provided that the companies might make no claim for loss or damage "to their business or traffic by reason of the diversion thereof or otherwise which has been or may be caused by said taking or by said possession, use, control, and operation."

If government operation were more efficient than, or equally efficient as, private operation, it would seem that railroads should earn as much under government operation. Granting the volume of business to be as great or greater, and the rates no lower, and increased to meet increased expenses, why should the same railroads not have earned as much under government management as the average earnings for three years immediately preceding government operation? In view of the promised economies of unified operations under Federal control, one would expect a better financial showing after the change from private to government operation. This was all the more to be expected because there was no hope for improved service during the war period.

The Director General adopted a number of measures designed to increase efficiency and to serve the purposes of the war. Of the economies that would follow these measures a great deal was said. Among the most important innovations were the following: a short routing of traffic; unification of facilities; reduction in passenger service, saving ten per cent in passenger train miles; increase in demurrage rates to encourage prompt unloading of cars; store door delivery in order to release equipment with minimum delay; sailing day plan—that is, fixing dates on which package freight would be received at stations; solid trainloads of particular commodities from point of origin to destination when practicable; permits for shipment of freight, under which war supplies had priority; bituminous coal zone plan, which was adopted to avoid cross shipments of bituminous coal; standardization of freight cars and locomotives; consolidated ticket offices; a universal mileage book; discontinuance of off-line traffic offices; changes in accounting; and a plan for developing inland waterways to supplement railway transportation. Each of these measures was presented to the country as a means of effecting large savings. The main purpose to be served, however, was the movement of troops and war supplies without delay. These measures did contribute to that end. The railroads were made to serve the War and Navy departments as truly as if they had been owned by the Government and constructed for military uses. Federal control was successful in making the transportation machine of the country a dependable and highly serviceable instrument in waging war. That is what the country wanted. The Government had the loyal coöperation of men, of management, and of shippers in achieving that purpose. The railroads were made to serve war purposes successfully, but at great loss and incon-

venience to shippers, particularly those not engaged in handling war supplies. For honesty, integrity, and efficiency in utilizing the railroads toward carrying forward the country's war program, high praise should go to the Director General, to his assistants, and to the rank and file of railway officials and employees.

Leaving military objectives out of the consideration, and looking to transportation service for peaceful pursuits, government operation even during the War and the first year and a half of reconstruction is illuminating. We should tell something from that experience as to whether or not government ownership and operation of railroads is desirable.

The traveling public was rather good-natured about curtailed passenger services until after the signing of the Armistice. The same may be said of shippers. Those who were not entitled to priority permits and who were trying to carry on their business, were often hard put to it to get shipments through. Before the end of Federal control, companies were sending pilots along with important shipments who used such means of persuasion as they had at their disposal to get cars through terminals and to destination. The sailing day plan was an economy that worked to advantage of certain distributing centers. The abolition of off-line freight agencies was heralded by the Government as a shining example of elimination of useless and expensive service. But the shipping public soon realized that these soliciting agencies had served as bureaus of information, had been relied upon to trace shipments, and to obtain reports on probable arrival of cars. The Government in the end yielded to complaints to the extent of creating central freight information bureaus. But the incentive to serve and to get results promptly was lacking in these bureaus, and the shippers were not satisfied with

these substitutes for a needed service to which they had become accustomed.

On May 25, 1918, freight rates were increased about twenty-five per cent and passenger fares were advanced to three cents per mile. Labor problems under Federal control were acute. There was the problem of making up for deferred increases before the War as well as of bringing wages of railway employees somewhat in line with the unusually high rates being paid by war industries. These war-time industries were recognized as being more or less on a temporary basis, and that they would have to close down with Peace. This being true, they obtained contracts from the Governments that would enable them to buy labor off from the established peace-time activities. The unusually high wages paid for temporary employment by industries working under pressure to turn out supplies greatly needed by armed forces, had the effect of completely upsetting wage schedules throughout the country. Moreover, the War period was one of inflation and rapidly advancing prices. The withdrawal of men from industry for fighting caused great shortage in the labor supply. During the period of hostilities the Federal authorities in charge of the railroads in May, 1918, granted the basic eight-hour day for all railway employees and granted increases effective as of January 1, 1918, ranging from 43 per cent for those receiving $45 per month down to enough to bring those receiving from $240 to $249 up to $250 per month. Supplemental orders rapidly followed, and rules more to the liking of employee representatives. Though a large part of the increases and changes in rules were in effect only a part of the year, the wage bill of the railroads for 1918 was about $875,000,000 greater than it had been in 1917, an increase of more than fifty per cent. In 1919, the Director General

sought to postpone the adjustment of further requests for wage increases. While he succeeded in the main, yet he felt compelled to make certain concessions in wages and in changes of rules, which substantially added to the sum total of wages paid. Moreover, the controversy which he succeeded in passing on to the Railroad Labor Board was rather promptly settled by that body through orders which added $600,000,000 more to the annual payment of wages.

During the period of federal operation of railroads, there was a large increase in the number of employees. When the railroads were taken over at the end of 1917, they had about 1,750,000 employees. When they were returned to their owners on March 1, 1920, they had approximately 2,000,000 employees. The average number of employees under private operation in the year 1917 was 1,732,876. Under government operation in 1918, there were 1,841,575; and in 1919 the average was 1,913,422.

NUMBER OF EMPLOYEES IN THE MONTH OF FEBRUARY

1920	1,970,525	(about)
1921	1,676,543	
1922	1,545,040	
1923	1,783,555	(Following strike of
1924	1,753,289	shop employees,1922)
1925	1,725,366	
1926	1,733,004	
1927	1,720,520	
1928	1,608,371	

Some of the great increase in the number of employees under government operation may be attributed to the adoption of the eight-hour day. After making the most charitable excuses for the radical increase in the number of employees under government operation, one must bear in mind that the number of hours worked by employees under private operation in 1917 was 5,438,000,000; and under government operation in 1918, the number of hours

worked was 5,701,000,000. In 1926 when the largest freight business in history was handled, the total number of hours worked was 4,671,000,000.

Considering the quality of the service rendered to the public, and the amount of transportation produced in proportion to the number of hours of human labor, and the number of tons of fuel and the materials used, there was a great decline of efficiency under government operation. By the same standard there has been a great increase in efficiency since the chaotic conditions of 1920 were remedied.

This great increase in the number of employees far beyond any increase in volume of business, constitutes a standing indictment against government operation of railroads. It cannot be explained away on the plea that the country was at war. With the great demand for man power created by the war, every patriotic consideration required that the railroads be operated with less men in 1918 and 1919 than had been the case in 1917.

As for earnings, the government officials in charge of railway management, it would seem, were justified in being optimistic. In spite of a curtailment of passenger service, and patriotic appeals to the people to ride the trains only in case of necessity, there was some increase in the number of passenger miles. In the case of freight, very little more was moved in 1918 than in 1917, while 1919 showed a decrease in the number of revenue tons carried from 2,305,000,000 in 1918 to 2,045,000,000 in 1919. Still the income received on an average for each ton of freight was $1.24 in 1917, but increased to $1.45 in 1918 and to $1.73 in 1919. With an increase in passenger rates, and with about the same tonnage in 1918 as in 1917, but moving at increased rates, one would expect the Government's management to make as good a finan-

cial showing as private management in 1917. Particularly is this true, when one recalls that while the total revenue ton miles of 1918 were four hundred and five billion as against three hundred and ninety-four billion in 1917, the average receipts per ton mile had been raised in 1918 to $.0085 from $.0071 in 1917. Yet the railroads lacked about $250,000,000 earning as much as the average annual operating income from 1915 to 1917, which the Government had guaranteed, and showed $272,000,000 less than the operating income of the first-class roads in 1917.

One might undertake to explain this by pointing out that the wage increase of May went into effect as of January, 1918, while the twenty-five per cent increase in freight rates was effective only from June of that year. In view of that suggestion [1] one might turn more hopefully to 1919. In that year we had peace, and there was still an increase in the number of revenue passengers carried and a slight increase over 1918 in the average length of journey. Revenue freight fell from four hundred and five billion ton miles in 1918 to three hundred and sixty-four billion ton miles in 1919, but this decrease in total ton miles was accompanied by an increase of receipts per ton mile from $.0085 to $.0097, which meant a greater income for carrying a less total tonnage. Yet the deficit for the entire period of Federal control covering twenty-six months was approximately $1,123,500,000 (Report of Director General of Railroads, 1924). About $250,000,000 of this accrued during 1918. Counting $125,000,000 for January and February, 1920, the deficit for 1919 seems to have been about $750,000,000. In any event the financial showing was so poor that it was not possible to get the facts until after the period of Federal control had ended. $530,000,000 must be added to cost of govern-

[1] Jones, "Principles of Railway Transportation."

ment operation, since the Interstate Commerce Commission under the Act of 1920 has allowed claims arising during the six months of guarantee which total that amount. That makes a total of $1,650,000,000.

The following tables are illuminating: [2]

FREIGHT TRAFFIC MOVEMENT AND CAR PERFORMANCE

Class I Railroads. Calendar Years 1918 and 1917

Item	Year 1918	Year 1917	Per Cent Inc.
Average miles of road	228,729	228,633	...
Ton miles (millions)	434,998	427,342	1.8
Freight train miles (thousands)	637,924	654,580	D 2.5
Loaded freight car miles (millions)	14,928	15,816	D 5.6
Empty freight car miles (millions)	7,128	6,717	6.1
Total freight car miles (millions)	22,056	22,533	D 2.1
Cars on line daily, serviceable	2,291,797	2,230,057	2.8
Cars on line daily, total	2,430,786	2,363,309	2.9
Averages			
Ton miles per train mile	682	653	4.4
Ton miles per loaded car mile	29.1	27.0	7.8
Per cent loaded to total car miles	67.7	70.2	D 3.6
Car miles per car day	24.9	26.1	D 4.6
Ton miles per car day	490	495	D 1.0

D denotes decrease. Ton miles include both revenue and non-revenue tons. The statistics include the performance of mixed trains.

CONDENSED INCOME ACCOUNT

Class I Railroads in Federal Control. Years 1918 and 1917

Item	1918	1917	Increase or Decrease	
			Amount	Per Cent
Operating revenues	$4,842,695,884	$3,988,827,671	853,868,213	21.4
Operating expenses	3,939,315,122	2,808,544,956	1,130,770,166	40.3
Net operating revenue	903,380,762	1,180,282,715	D 276,901,953	D 23.5
Net railway operating income	688,200,083	960,492,111	D 272,292,028	D 28.3
Standard return	890,335,685	.....	.....	.....
Per cent net railway operating income to standard return	77.3	.....	.....	.....
Deficit	202,135,602	.....	.....	.....

D denotes decrease. These returns include the results of operation of 150 Class I railroads with an aggregate road mileage of 230,769. Net railway operating income as used here corresponds with its definition in the Federal Control Act, viz., net operating revenue minus railway tax accruals and uncollectible railway revenues, plus or minus the net balances for equipment rents, joint facility rents, and miscellaneous Federal income items (if any). The standard return given here is the figure as it appeared at that time. Since then it has been changed slightly by adjustments.

[2] W. J. Cunningham, *American Railroads*, A. W. Shaw Co., pp. 129, 132.

The Government was especially fortunate in the personnel of the management. Each Director General was able and surrounded himself with experienced and competent advisers. Patriotism and loyalty held the railway staffs to the service during government operation. Patriotism and willingness to make sacrifices during the War led the shipper and the general public to accept almost any reasonable innovations the Government might introduce into the railway service. Moreover, Federal control occurred during an era of prosperity for both agriculture and industry. Practically every farm and factory was earning profits. The country expected the railroads under government management at least to pay their way; especially were people rather sanguine in that expectation, since the carriers had paid operating expenses and increasing dividends for three years, and since they were assured that the Government was introducing many economies not practiced under private ownership.

Additions and betterments were added to the capital accounts of the railroads and not taken out of earnings. The Federal Control Act had provided $500,000,000 as a revolving fund to be used by the Railroad Administration to pay for additional facilities or equipment required by government operation. Advances could be made from the revolving fund for additions and improvements, such advances to be charged against the carrier, to bear interest, and to be repaid so that the Government would be fully reimbursed in the final settlement. The cost of work required solely for war purposes was to be assumed by the Government. Sidings at military camps are examples. In 1918 there was expended on capital account, $592,000,000. In 1919 the sum so expended was $571,000,000. Of the total of about one and a quarter billion dollars so

expended during the twenty-six months of Government operation, about one-half was for new equipment.

Under the contracts between the railroads and the Government, it was agreed that the Government would maintain the properties and turn them back at the end of Federal control in as good condition as when received. The Director General was no doubt perfectly sincere in the belief that the Government was living up to that agreement. He certainly could point to the fact that the Government spent on an average 93 per cent more for maintenance of railroads in 1918 and 1919 than the railway companies themselves had spent during the test period. The average yearly expenditures for maintenance of way, structures, and equipment during the test period was $964,000,000. The Government spent in 1918 a little over $1,742,000,000 and in 1919 as much as $1,983,000,000. By reason of advances in prices, however, the Government obtained less ties, rails, and the like for the larger expenditure than the railroads had purchased during each year of the test period. The Director General contended that at the end of the Federal control the Government would be indebted to some carriers for inadequacy in some elements of maintenance, but that on the other hand some carriers would be indebted to the Government for overmaintenance. He believed that these respective claims would offset each other. Later the carriers proved and were allowed $222,696,000 of undermaintenance and contended that several hundred millions more were due by reason of the wear and tear to their equipment and property during government operation.

It is a fact that under government operation the railway budget was not balanced. As a result of deficits from operating the railroads American taxpayers had to appro-

priate more than one and one-half billion dollars from the general treasury to meet such deficits. The railway budget could have been balanced. Under the heavier burdens by reason of adding $600,000,000 per annum to the wage bill in 1920, the railroads under private management did within a few months effect a balancing of what may be termed the aggregate railway budget of the country. It may be said that that was possible only through an increase of charges for transportation. Exactly that is true. Why should government management have charged less for transportation services rendered than the cost of performing those services? The evidence must lead the unbiased student to the conclusion that those in authority were afraid of the political consequences of increasing rates to where railway expenses could be met. Wages were increased, as most people agreed was just and proper. To increase wages at the time was good politics. Along with wage increases and with mounting costs of railway supplies, there should have gone such increases in freight rates as were necessary to meet the added burdens. The historian must conclude that the decision to look to the Government Treasury instead of to those who were buying transportation was the result of political considerations, a counsel of expediency, an unwillingness to face temporary unpleasantness for the sake of sound business methods, stronger credit, and less trouble in the future.

CHAPTER XVIII

PERFORMANCE OF RAILROADS IN THE UNITED STATES SINCE THEY WERE RETURNED TO THEIR OWNERS

THE seven years beginning January 1, 1921, reveal most impressive achievements by the railway managements of the United States. The great expansion in the business of the country is shown by the accompanying tables on revenue car loadings and net ton miles.

TABLE NO. 1

REVENUE CAR LOADINGS

1921	39,323,000 [a]
1922	43,208,000 [a]
1923	49,812,000 [b]
1924	48,527,000 [c]
1925	51,224,000 [b]
1926	53,100,000 [b]
1927	51,714,000 [d]

[a] *Railway Age*, Vol. 76, No. 1, p. 49.
[b] *Ibid.*, Vol. 84, No. 1, p. 24.
[c] *Ibid.*, Vol. 80, No. 1, p. 31.
[d] A Review of Railway Operations in 1927. Bureau of Railway Economics, 1928.

TABLE NO. 2

NET TON MILES

1921	340,862,150,770 [a]
1922	371,945,560,691 [a]
1923	456,237,879,523 [a]
1924	426,833,710,571 [a]
1925	452,818,681,431 [a]
1926	486,265,430,140 [a]
1927	474,683,000,000 [b]

[a] Interstate Commerce Commission Annual Reports (Statistical Summary Number 7 of the Bureau of Railway Economics).
[b] A Review of Railway Operations in 1927. Bureau of Railway Economics, 1928.

DOMINION OF CANADA
Lake Superior
L. Michigan
L. Huron
L. Erie
L. Ontario
Hudson Bay
ATLANTIC OCEAN
PACIFIC OCEAN
GULF OF MEXICO
GULF OF CALIFORNIA
MEXICO
Seattle
Portland
Spokane
Tacoma
Bellingham
Helena
Great Falls
Havre
Glendive
Miles City
Billings
Bismarck
Minneapolis
Duluth
Sault Ste. Marie
Detroit
Toronto
Buffalo
Rochester
Albany
Boston
Montreal
Quebec
Portland
Chicago
Milwaukee
Green Bay
Omaha
Lincoln
Denver
Cheyenne
Pueblo
Colorado Springs
Kansas City
St. Louis
Cincinnati
Pittsburgh
Cleveland
Columbus
Indianapolis
Louisville
Nashville
Memphis
Atlanta
Charleston
Savannah
Jacksonville
Miami
Tampa
New Orleans
Mobile
Birmingham
Chattanooga
Knoxville
Richmond
Norfolk
Washington
Baltimore
Philadelphia
New York
Newark
Wilmington
Salt Lake City
Ogden
Reno
Sacramento
San Francisco
Oakland
Los Angeles
San Diego
Santa Barbara
Fresno
Bakersfield
Phoenix
Tucson
El Paso
Albuquerque
Santa Fe
Amarillo
Dallas
Fort Worth
Houston
Galveston
San Antonio
Austin
Waco
Oklahoma City
Tulsa
Little Rock
Shreveport
Vicksburg
Jackson
Meridian
Montgomery
Columbia
Charlotte
Greensboro
Raleigh
Wilmington
Scranton
Harrisburg
Trenton
Atlantic City
Providence
Hartford
New Haven
Springfield
Worcester
Portland
Concord
Manchester
Burlington
Rutland
Albany
Syracuse
Rochester
Buffalo
Niagara Falls
Erie
Toledo
Cleveland
Akron
Canton
Youngstown
Columbus
Dayton
Springfield
Cincinnati
Indianapolis
Fort Wayne
South Bend
Gary
Chicago
Milwaukee
Madison
Green Bay
Duluth
Minneapolis
St. Paul
Rochester
Winona
La Crosse
Eau Claire
Superior
Fargo
Grand Forks
Minot
Williston
Bismarck
Mandan
Dickinson
Glendive
Miles City
Billings
Great Falls
Havre
Shelby
Kalispell
Missoula
Butte
Helena
Bozeman
Livingston
Yellowstone
Cody
Thermopolis
Casper
Rawlins
Laramie
Cheyenne
Sterling
Grand Island
Hastings
Kearney
North Platte
McCook
Lincoln
Omaha
Council Bluffs
Sioux City
Des Moines
Davenport
Iowa City
Cedar Rapids
Waterloo
Mason City
Rochester
Winona
La Crosse
Eau Claire
Superior
Duluth
Minneapolis
St. Paul

In 1921 more than thirty-nine million freight cars were loaded with revenue-producing freight. In 1927 there were nearly fifty-two million, or an increase of twelve million cars loaded in 1927 over 1921. Moreover car loadings reached the record of fifty-three million, or more than an average of a million each week in 1926. Net ton miles also jumped during this period from 340 billion to 474 billion. A ton mile is the movement of one ton of freight a distance of one mile. A car loaded with fifty tons of goods, if moved one mile, would yield 50 net ton miles for that movement. Alongside this substantial increase in the volume of freight business there has been a decided decline of revenue from the passenger business.

TABLE NO. 3

PASSENGER MILES

1921	37,312,585,966 [a]
1922	35,469,961,582 [a]
1923	37,956,594,827 [a]
1924	36,090,886,478 [a]
1925	35,950,222,811 [a]
1926	35,477,524,581 [a]
1927	33,660,000,000 [b]

[a] Interstate Commerce Commission Annual Reports (in Statistical Summary Number 7 of the Bureau of Railway Economics).

[b] A Review of Railway Operations in 1927. Bureau of Railway Economics, 1928.

A decrease of more than three billion passenger miles means a decline of an average of slightly less than one-half billion passenger miles each year of the period. This has resulted in an average decline in passenger revenues of fifteen million dollars each year of the seven-year period. This average decline has been cumulative and in 1927 was nearly one hundred million dollars below 1921. Though there was an increase of 40 per cent in the net ton miles of revenue paying freight, the total operating revenue increased from 1921 to 1927 only about $700,000,000, or about 13 per cent in seven years.

TABLE NO. 4

TOTAL OPERATING REVENUE

1921	$5,516,598,242 [a]
1922	5,559,092,708 [a]
1923	6,289,580,027 [a]
1924	5,921,496,325 [a]
1925	6,122,509,856 [a]
1926	6,382,939,546 [a]
1927	6,127,313,906 [b]

[a] Interstate Commerce Commission Annual Reports (in Statistical Summary Number 7 of the Bureau of Railway Economics).
[b] Interstate Commerce Commission, Preliminary Statement of Capitalization and Income. Statement No. 2860, 1928.

The total operating expenses were held down year by year to nearly what they were in 1921. The peak year for operating expenses was 1923, and the figure has dropped considerably since then.

TABLE NO. 5

TOTAL OPERATING EXPENSES

1921	$4,562,668,302 [a]
1922	4,414,522,334 [a]
1923	4,895,166,819 [a]
1924	4,507,885,037 [a]
1925	4,536,880,291 [a]
1926	4,669,336,736 [a]
1927	4,565,971,112 [b]

[a] Interstate Commerce Commission Annual Reports (in Statistical Summary Number 7 of the Bureau of Railway Economics).
[b] Interstate Commerce Commission, Preliminary Statement of Capitalization and Income. Statement No. 2860, 1928.

This is the more surprising when wages alone were $181,000,000 greater in amount, in 1926, than in 1921.

TABLE NO. 6

AGGREGATE WAGES

1921	$2,765,218,079 [a]
1922	2,640,817,005 [a]
1923	3,004,071,882 [a]
1924	2,825,775,181 [a]
1925	2,860,599,920 [a]
1926	2,946,118,103 [a]
1927	2,952,000,000 [b]

[a] Interstate Commerce Commission. Statistics of Railways.
[b] A Review of Railway Operations in 1927. Bureau of Railway Economics, 1928.

Though the seven years here under consideration was a period of decline in the cost of living, yet the average wages of employees after a decline from 1921 to 1924 have climbed steadily since then to a level higher than in 1921.

TABLE NO. 7

Average Wages	
1921	$1,666.28 [a]
1922	1,623.29 [a]
1923	1,617.11 [a]
1924	1,613.47 [a]
1925	1,639.96 [a]
1926	1,655.79 [a]
1927	1,673.00 [b]

[a] Interstate Commerce Commission. Statistics of Railways.
[b] A Review of Railway Operations in 1927. Bureau of Railway Economics, 1928.

The average number of hours worked per employee has been surprisingly constant since 1922.

TABLE NO. 8

Average Number of Hours per Employee	
1921	2,499.1 [a]
1922	2,650.0 [a]
1923	2,653.1 [a]
1924	2,589.3 [a]
1925	2,597.8 [a]
1926	2,625.6 [a]
1927	2,615.8 [a]

[a] Interstate Commerce Commission. Statistics of Railways.

Taxes have increased from $276,000,000 in 1921 to $388,000,000 in 1926, an increase of 40 per cent. The

TABLE NO. 9

Taxes	
1921	$275,875,990 [a]
1922	301,034,923 [a]
1923	331,915,459 [a]
1924	340,336,686 [a]
1925	358,516,046 [a]
1926	388,922,856 [a]
1927	375,097,875 [b]

[a] Interstate Commerce Commission Annual Reports (in Statistical Summary Number 7 of the Bureau of Railway Economics).
[b] Interstate Commerce Commission. Preliminary Statement of Capitalization and Income. Statement No. 2860, 1928.

railroads now pay very nearly as much in taxes as they pay in dividends to their shareholders.

With steadily decreasing passenger revenues, with wages on the upward trend, and with taxes mounting, the railroads have almost doubled their net operating income since 1921.

TABLE NO. 10

NET OPERATING INCOME

1921	$ 600,937,356 [a]
1922	760,187,319 [a]
1923	961,955,457 [a]
1924	973,837,202 [a]
1925	1,121,076,341 [a]
1926	1,213,089,966 [a]
1927	1,068,514,928 [b]

[a] Interstate Commerce Commission Annual Reports (in Statistical Summary Number 7 of the Bureau of Railway Economics).
[b] Interstate Commerce Commission. Preliminary Statement of Capitalization and Income. Statement No. 2860, 1928.

The return on property investment has been raised to 4⅔ per cent in 1923 and held near that rate of return for each succeeding year.

TABLE NO. 11

RETURN ON PROPERTY INVESTMENT IN ROAD AND EQUIPMENT

1921	3.07% [a]
1922	3.83% [a]
1923	4.66% [a]
1924	4.54% [a]
1925	4.97% [a]
1926	5.23% [a]
1927	4.40% [b]

[a] Interstate Commerce Commission Annual Reports (in Statistical Summary Number 7 of the Bureau of Railway Economics).
[b] A Review of Railway Operations in 1927. Bureau of Railway Economics, 1928.

This performance must be considered in the light of the reductions in receipts per unit of service rendered.

RECEIPTS PER TON MILE AND PASSENGER MILE, 1921–1927

	Receipts per Ton Mile (Cents)	Receipts per Passenger Mile (Cents)
1921[1]	1.294	3.093
1922[1]	1.194	3.037
1923[1]	1.132	3.026
1924[1]	1.132	2.985
1925[1]	1.114	2.944
1926[2]	1.081	2.936
1927[2]	1.080	2.896
Per cent decrease:		
1927 under 1926	0.1	1.4
1927 under 1921	15.3	6.2

[1] I. C. C. Statistics of Railways in U. S., 1925, p. civ.
[2] A Review of Railway Operations in 1927. Bureau of Railway Economics, 1928.

The public not only increased the amount of taxes collected from the railroads, but continued to get the services of the carriers at decreasing prices.

Since 1921 though passenger business has fallen off year by year, the charges made of passengers have been lowered six per cent. The shipping public has seen freight rates come down approximately fifteen per cent below the level of 1921. In 1911 the railroads paid out in dividends to their stockholders the sum of $397,000,000. Fifteen years later, in 1926, the railroads, after breaking all records in volume of freight traffic handled, paid to their shareholders $399,000,000. Taxes on the railroads in 1911 amounted to $98,600,000 as against $388,000,000 in 1926.

The railroads have made capital expenditures of four and three-quarter billion since 1921.

TABLE NO. 12

CAPITAL EXPENDITURE

1922	$ 429,000,000 [a]
1923	1,059,000,000 [b]
1924	875,000,000 [b]
1925	748,000,000 [b]
1926	885,000,000 [b]
1927	771,552,000 [c]

[a] *Railway Age*, Vol. 80, No. 1, p. 33.
[b] *Ibid.*, Vol. 84, No. 1, p. 27.
[c] A Review of Railway Operations in 1927. Bureau of Railway Economics, 1928.

The tentative valuation of the railroads at the beginning of this period was about nineteen billion dollars. If that sum in the judgment of the Commission represented the original cost or prudent investment it can be said that the carriers have within seven years obtained twenty-five per cent of that sum for capital investment in the railway net of the United States. That is to say, within seven years they have secured an amount equal to one-fourth as much as the Commission had assessed them at the end of the previous ninety-three years.

The explanation of this capacity to carry greatly increasing financial burdens along with a decreasing rate of return for services performed, and in the face of an actual decline in the passenger business, is found in the main in the increasing efficiency with which the railroads have been operated.

There has been some decline in prices of supplies purchased by the railroads, but that by no means accounts for the savings realized.

In 1923 the railroads adopted a program to provide adequate transportation service which included the following objectives:

1. To keep the percentage of locomotives and cars awaiting repairs at the lowest possible minimum consistent with the volume of business offered and the revenues available.

2. Increased supervision on the part of the railroads and greater coöperation with shippers to bring about better utilization of car capacity.

3. A continued and intensive effort to increase the miles per car per day in an endeavor to make new records of achievement in prompt movement of traffic.

4. Continued study and consideration of the possibility of the greatest joint use of facilities.

5. Additions to the routine relations between the railroads and Regional Shippers Advisory Boards governing matters of service and car supply, studies of distribution practices, production and market conditions, should be made with a view to effecting improvements in the present methods of distributing commodities and eliminating delays at reconsigning points, and of unloading cars at terminal points, especially cars of perishable products, lumber, and coal.

This increasing efficiency in operation is seen first in the average distance a freight car is moved in a single day. In getting this average the total distances of every freight car in movement on a given day are added, and this total is divided by the number of freight cars in existence regardless of whether they were all in movement or not. The accompanying table shows that the miles a freight car was carried on an average in one day increased from 22 miles in 1921 to 30 miles in 1927.

TABLE NO. 13

MILES PER FREIGHT CAR PER DAY

1921	22.4 [a]
1922	23.5 [a]
1923	27.8 [a]
1924	26.9 [a]
1925	28.5 [a]
1926	30.4 [a]
1927	30.4 [b]

[a] Interstate Commerce Commission, Statistics of Railways.
[b] A Review of Railway Operations in 1927, Bureau of Railway Economics, 1928.

Likewise the average distance traversed by a freight locomotive in a single day increased from 49½ miles in 1921 to 61 miles in 1927. It is in the increased train loads hauled that efficiency is most clearly revealed. The net tons of freight carried on an entire train averaged 651 tons in 1921. Six years later the average freight train loading had risen to 778 tons, being an increase of 19.5 per cent over 1921.

TABLE NO. 14

NET TONS PER TRAIN

1921	651 [a]
1922	677 [a]
1923	713 [a]
1924	715 [a]
1925	744 [a]
1926	772 [a]
1927	778 [b]

[a] Interstate Commerce Commission, Statistics of Railways.
[b] A Review of Railway Operations in 1927. Bureau of Railway Economics, 1928.

This was accomplished without any gain in the amount carried on an average in a freight car.

TABLE NO. 15

NET TONS PER LOADED CAR

1921	27.6 [a]
1922	26.9 [a]
1923	27.9 [a]
1924	27.0 [a]
1925	27.0 [a]
1926	27.4 [a]
1927	27.2 [b]

[a] Interstate Commerce Commission, Statistics of Railways.
[b] A Review of Railway Operations in 1927, Bureau of Railway Economics, 1928.

In fact the Car Service Division of the American Railway Association has worked most persistently in encouraging shippers, through their advisory boards, to load to capacity. This effort has had the effect of keeping the net loading from falling off to an appreciable extent. That in itself is a performance quite creditable both to carriers and to shippers when it is remembered that more prompt deliveries and faster train schedules have made it possible for dealers greatly to reduce their inventories. Many dealers, as a result, order more frequently but far less amounts at one time. This somewhat lessens the occasion for heavy loadings of merchandise and increases the pressure on important shippers to load individual cars rather lightly. The great increase in net tons per train has been due to lengthening the trains; that is, in hauling more cars in a single train. This has come about as the result of installing more powerful locomotives, and improving track, bridges, and grades so that these heavy locomotives and longer trains can be handled in safety. These improvements in way and equipment account for a considerable percentage of the nearly five billions of capital invested in the railroads during the past seven years. The increase in the average distance a car is moved each day though the average loading has not increased, is further reflected in a statement of performance in terms of net ton miles per car day.

TABLE NO. 16

NET TON MILES PER CAR DAY

1921	389 [a]
1922	424 [a]
1923	510 [a]
1924	472 [a]
1925	495 [a]
1926	532 [a]
1927	518 [b]

[a] Interstate Commerce Commission, Statistics of Railways.
[b] A Review of Railway Operations in 1927, Bureau of Railway Economics, 1928.

The net ton miles achieved with one freight car on an average for one day was 389 in 1921, while in 1927 a single car in a single day might be said to do the equivalent of moving a single ton a distance of 518 miles. In 1921 the average freight train was responsible for 7506 net ton miles per hour, while in 1927 an average freight train produced 9585 ton miles in one hour.

There has been quite an effort on the part of the railroads to conserve fuel. In 1921 there were consumed for every 1000 gross ton miles 162 pounds of fuel. By gross ton miles is meant the inclusion of the weight of locomotive and cars as well as of freight carried. In 1927 only 131 pounds of fuel were required to produce 1000 gross ton miles.

TABLE NO. 17

POUNDS OF FUEL CONSUMED PER 1000 GROSS TON MILES

1921	162 [a]
1922	163 [a]
1923	161 [a]
1924	149 [a]
1925	140 [a]
1926	137 [a]
1927	131 [b]

[a] Interstate Commerce Commission, Statistics of Railways.
[b] A Review of Railway Operations in 1927, Bureau of Railway Economics, 1928.

In 1921 about 18 pounds of fuel were required to produce a passenger train car mile, while in 1927, on an average, about 15 pounds of fuel were consumed in achieving the same result.

TABLE NO. 18

POUNDS OF FUEL CONSUMED PER PASSENGER TRAIN CAR MILE

1921	17.7 [a]
1922	17.9 [a]
1923	18.1 [a]
1924	17.0 [a]
1925	16.1 [a]
1926	15.8 [a]
1927	15.4 [b]

[a] Interstate Commerce Commission, Statistics of Railways.
[b] A Review of Railway Operations in 1927, Bureau of Railway Economics, 1928.

At first, policy in the United States was to regard railroads as being supplemental to canals and waterways. Nationalization of avenues of transportation was regarded as being desirable. By 1850 the country decided to abandon government ownership and operation of railroads, and to rely upon initiative of individuals to provide the properties, and upon competition to regulate the operations.

After the Civil War it was recognized that the Government should regulate railway activities. There were evils flowing from unrestrained competition and other evils growing out of the tendency of railroads to become monopolistic. The public was inclined to attribute both types of evils to the tendencies toward monopoly, and in the legislation, state and federal, culminating in the Act to Regulate Commerce, there was the effort to preserve and even to compel competition, and to ignore or to restrain monopoly. During the past twenty years the public has come to see that railroads as built and managed in this country are both competitive and monopolistic. In some respects they should remain competitive and their competition should be regulated. In other respects they must be monopolistic, and be subject to regulation by reason of their monopolistic powers. And in still other respects the railway managements should be left alone to go their own way as in any private business.

The experience of one hundred years has revealed that railroads may not be treated so simply as (1) by leaving them alone, (2) by compelling maximum competition, (3) by regulating competition, or (4) by regulating monopoly. The railway business is quite complicated. Nationalization of the railroads would not lessen the complexity of the business. A century of experimentation and on the whole successful experience in developing railway transportation in the United States suggests three con-

clusions: (1) Whatever may be said in favor of nationalization, Americans having rejected it at the outset, have built a satisfactory railway system; (2) government as it

RAILROADS OF THE UNITED STATES

(Class I Railways)

Item	For Year Ending		
	December 31, 1924	December 31, 1925	December 31, 1926
Average miles operated.....	235,501	236,581	236,631
Capitalization or cost of construction	$22,546,272,840	$23,620,966,783	$24,290,196,788
Capitalization or cost of construction per mile	95,737	99,843	102,650
Employees and equipment:			
Number of employees	1,751,362	1,744,311	1,779,281
Number of locomotives ...	65,358	63,974	62,760
Number of passenger cars..	55,040	54,622	54,773
Number of freight cars ...	2,379,096	2,387,551	2,378,441
Services:			
Passengers carried	932,678,462	888,267,296	862,361,333
Tons of freight carried	1,187,295,744	1,247,241,615	1,336,142,323
Tons of freight carried one mile	388,415,312,335	413,814,261,072	443,746,487,348
Train miles	1,171,811,559	1,187,731,430	1,211,617,435
Locomotive miles	1,660,481,496	1,689,791,902	1,736,647,401
Results of operation:			
Operating revenues	$5,921,496,325	$6,122,509,856	$6,382,939,546
Operating expenses	4,507,885,037	4,536,880,291	4,669,336,736
Net operating revenue.....	1,413,611,288	1,585,629,565	1,713,602,810
Operating ratio—per cent..	76.13	74.10	73.15
Charges:			
Passenger revenues	1,075,039,219	1,056,395,303	1,041,816,167
Average receipts per passenger	1.15	1.19	1.21
Average receipts per passenger mile	2.978¢	2.938¢	2.936¢
Freight revenue	4,333,585,195	4,541,646,040	4,797,780,122
Average receipts per ton mile	1.116¢	1.097¢	1.081¢
Taxes	340,336,686	358,516,046	388,922,856

Source: Annual Reports of the Interstate Commerce Commission.

has come to be is not suited to the operation of railroads; (3) the complexity of the railway business must be recognized, and certain types of railway competition should be preserved and regulated, while at the same

time certain manifestations of monoply should be accepted and regulated, and in some respects railway managements should be left entirely free as in the case of unregulated private enterprise.

CHAPTER XIX

RAILWAY COMPETITION AND GOVERNMENT MONOPOLY

In this survey an effort has been made to set forth the results of the operations of the railroads in different countries, in so far as the facts can be ascertained. Before private ownership and operation is abandoned in this country, the proof should be clear that such a change would result in better service for the same cost or in as good service for less cost. The problem is not complicated by questions of public interest that require railway transportation. Under either public or private ownership and operation the country would have railway transportation with resulting economic and social benefits. In the United States it is not a question of which arrangement to adopt in order to obtain railway service.

The railroads are in existence. During the past century they have been constructed and managed by private owners. After making due allowance for differences in types of service required from one country to another, one may safely say that the service rendered in the United States is equal to, if not superior to, that to be found in countries where the Government owns and operates railroads. When the question of government ownership or operation is raised in this country, it has no connection with supplying needed transportation. That is being done. Many private railway managers have earned reputations for being public-spirited. All the questions of the

public good or the public welfare which can be raised in connection with a proposal to change from private to government ownership and operation can be reduced to questions of cost and of the quality of service.

While it seems clear from the foregoing chapters that experience in other countries does not justify Americans in expecting that government ownership and operation would bring either better service or lower costs, some further observations should be made in concluding this book.

Those who advocate government ownership and operation of railroads emphasize what they conceive to be the disadvantages of competition. In order to get rid of the evils that they see flowing from competition, they propose to substitute a government monopoly.

Competition between railroads has its characteristic tendencies. The one from which flows the evils most complained of is the tendency for competition to become ruinous or as is often said, "cutthroat." This tendency of railway competition to become ruinous is in the main due to the fact that from one-half to about three-fifths of the costs do not vary with the amount of the traffic. To illustrate, if the total expenses of a railroad are ten million dollars a year, the management knows that about six million dollars of the expenses will go on even if they should receive no business. Such items as interest on bonds, taxes, depreciation from weather and age, are in the main constant and do not vary directly with the amount of traffic handled. So long as a railroad does not have business up to its capacity to handle it, there is a desire and an effort to obtain additional traffic. If the additional business can be attracted without reducing the rates, so much the better. Since the expenses do not increase in the same ratio as the traffic, the road is under

strong temptation to cut rates in order to get more business. The road is subject to this temptation so long as the rate on the new business will bring in more than the expenses arising by reason of receiving and handling the additional traffic. If the rate is high enough to make some slight contribution to the constant costs after paying the added expenses arising from receiving the business, there is apt to be a scramble between competing roads to get new business or to attract business from the rails of one line to the rails of the other. This is well illustrated and explained by the following statement:

> Let us take an instance from railroad business—here made artificially simple for the sake of clearness, but in its complicated forms occurring every day. A railroad connects two places not far apart, and carries from one to the other (say) 100,000 tons of freight a month at 25 cents a ton. Of the $25,000 thus earned, $10,000 is paid out for the actual expenses of running the trains and loading or unloading the cars; $5,000 for repairs and general expenses; the remaining $10,000 pays the interest on the cost of construction. Only the first of these items varies in proportion to the amount of business done; the interest is a fixed charge, and the repairs have to be made with almost equal rapidity, whether the material wears out, rusts out, or washes out. Now suppose a parallel road is built and in order to secure some of this business offers to take it at 20 cents a ton. The old road must meet the reduction in order not to lose its business, even though the new figure does not leave it a fair profit on its investment; better a moderate profit than none at all. The new road reduces to 15 cents; so does the old road. A 15-cent rate will not pay interest unless there are new business conditions developed by it; but it will pay for repairs, which otherwise would be a dead loss. The new road makes a still further reduction to 11 cents. This will do little toward paying repairs, but that little is better than nothing. If you take at 11 cents freight that cost you 25 cents to handle, you lose 14 cents on every ton you carry. If you refuse to take it at that rate, you lose 15 cents on

every ton you do not carry. For your charges for interest and repairs run on, while the other road gets the business.[1]

If competition should drive rates down to where the railroads receive only enough revenue to meet the costs that vary with the volume of the business, there would be nothing to apply to the larger amount of costs which up to the point of saturation are constant and independent of the volume of the business. Such a situation would bring financial failure and bankruptcy to the railroads. That kind of competition is ruinous. The fact that it is due to the large percentage of costs which are independent of the amount of traffic handled and to the highly specialized form of railway investment, is a characteristic of railway competition. In most industries, if the price of the product will not yield enough revenue to meet fixed charges, the plant may be adapted to other uses whose earnings will be greater. But a railroad is so highly specialized that it can be used for nothing else, and capital invested in a railroad is irrevocably committed to that particular enterprise.

Competition between railroads is more apt to be ruinous if there be few competing lines, and if the capacity of the roads is not pretty well utilized by existing traffic. Some examples of the rate wars which have grown out of this kind of competition may be illuminating. When the Pennsylvania and the New York Central both entered Chicago in 1869, there followed bitter rate wars. In the summer of 1869 the rate on first-class freight fell from $1.88 to 25 cents per hundred pounds. In 1874 the Baltimore & Ohio reached Chicago and the Grand Trunk connected Milwaukee and Detroit with Atlantic ports. There was not enough traffic to maintain

[1] Hadley, "Railroad Transportation," pp. 70-71.

the existing trunk lines in official territory. The result was a ruinous rate war or a series of such wars among the railroads in a scramble to take business away from each other. In 1876 quoted rates between Chicago and New York fell to 15 cents on first-class and to 10 cents on fourth-class freight. In 1888 the rate on dressed beef between these points was reduced to 7 cents per hundred pounds.

Among the results of such ruinous competition were most of the so-called evils of competition. Among these abuses were discriminations between persons and between localities. Such favoritism was a weapon used by traffic managers in their campaigns of offense or defense against competing railroads. Important shippers and groups of shippers became expert in playing one road off against another and thereby encouraging most objectionable favoritism.

In order to protect themselves against the ruinous consequences of fighting over a volume of traffic in itself insufficient even at fair rates properly to nourish the existing railroads, railway officials during the seventies and eighties organized pools of traffic or of earnings. It was quite difficult to arrange such a pool in the first place, more difficult to get all the member roads to enforce among their employees the terms of the agreement, and quite difficult to bring about a renewal of the agreement after its expiration. With the appearance of regulation by State and Federal governments the public for many years was disposed to frown upon railway pools. The carriers then tried traffic associations through which efforts were made to fix and stabilize rates on a living basis. These were found to be contrary to the anti-trust laws, though there is slight evidence that Congress had railroads in mind when the anti-trust legislation was

first enacted. The carriers then sought stabilization of rates and escape from the everlasting pressure to discriminate between persons and places by turning to a more permanent and less flexible form of coöperation through actual unifications of competing lines. Some of these efforts were barred by court action as having the effect of destroying or substantially lessening competition, the maintenance of which was believed to be in the public interest. After 1899 there was a decade of remarkable prosperity and business expansion which created such volumes of railway traffic as to utilize existing lines in many instances nearly to, if not up to, capacity. In some instances additional tracks had to be laid to care for the business offered. When the business of the country caught up with the overbuilt railway net, the strongest incentives and temptations to discrimination and to ruinous competition were removed.

In the meantime State and Federal governments were working out policies of regulation in the light of experience and with a view to attaining objectives which seemed desirable. The Hepburn Act of 1906 made rebating too dangerous to be extensively practiced. The Mann-Elkins Act of 1910 gave the Commission power to suspend proposed increases in freight rates and other such powers as made it effective in preventing most of the abuses which may be attributed to the tendency of railway competition to become ruinous. After more than thirty years of experience with federal regulation, the Congress in 1920 made the Commission a real arbiter in disputes between railroads, between groups of shippers, and between shippers and railroads. It was recognized that many of the abuses were traceable to the shippers and that shippers must be subjected to as careful regulation in their use of railroads as the roads themselves in

serving shippers, if the public interest is to be served. Under the supervision of the Commission pooling agreements may be entered into between carriers, traffic associations may function, and consolidations of separate carriers may be effected. The public has recognized that the carriers must be permitted to earn enough to pay operating expenses, depreciation, interest on bonds, taxes, and reasonable dividends to stockholders. It is recognized that reasonable dividends are such as will attract sufficient capital to the railway business to enable the railroads to provide themselves with such improvements, enlargements, and expansions of facilities as the commercial development of the country may require or justify. Beyond that it is not necessary to reward the railroads. Therefore, the Commission has power to inquire into and to fix from time to time a standard rate of return toward which there may be adjustment of rates and fares. With the development and growth of the volume of the nation's business and with the more satisfactory rules and machinery for regulation, with the Commission's power to prescribe minimum rates, the tendency toward ruinous competition between railroads is held in check and the evils have been pretty well eliminated. That is to say, the abuses of railway competition have been rather successfully suppressed, while the advantages have been retained.

Competition of railroads has been much discussed and often misunderstood. The consequences which flow from understanding or misunderstanding of its character are so far reaching as to call for further consideration of the attitude of important groups. The attitude of the American people toward competition is well stated in an opinion of the Supreme Court of the United States.[2]

[2] U. S. v. Freight Association, 166 U. S. 290, p. 336.

Competition, free and unrestricted, is the general rule which governs all of our ordinary pursuits and transactions of life. Evils, as well as benefits, result therefrom. In the fierce heat of competition the stronger competitor may crush out the weaker; fluctuations in prices may be caused that result in wreck and disaster; yet, balancing the benefits against the evils, the law of competition remains as a controlling element in the business world. That free and unrestricted competition in the matter of railroad charges may be productive of evils does not militate against the fact that such is the law governing the subject. No law can be enacted nor system devised for the control of human affairs that in its enforcement does not produce some evil results, no matter how beneficial its general purposes may be. There are benefits and there are evils which result from the operation of the law of free competition between railway companies.

The railway supply companies consistently oppose railway monopoly, government or otherwise, on the ground that it retards invention. They point out that it is not difficult to secure the adoption of new devices when there are a number of railway officers to whom application may be made, whereas under government operation all the railroads would be under one control. Acworth has said, "In all the history of railway development, it has been the private companies that have led the way; the State systems that have brought up the rear. It would be difficult to point to a single important invention or improvement the introduction of which the world owes to a State railway. England shares with America the credit of having invented the locomotive. England first rolled steel rails, but America was not long behind. England first introduced the block system of signaling; while to America is mainly due the later development of automatic appliances. There are two types of power brakes on the world's railways. The Westing-

house brake was invented in America, the vacuum brake in England. The automatic coupler is wholly American. So are the sleeping car and the dining car. Shunting by gravity, which accounts for a saving of millions of pounds a year, was invented in England, but has been mainly developed in America. Brunel, on the Great Western of England, first taught the world what express trains meant. And forty years later, the English companies in the historic 'Race to Edinburgh' in 1888 gave a new interpretation of the term. America promptly replied with the 'Empire State Express' and bettered the instruction with the 'Atlantic City Flyers.' The French companies, too, took up the challenge and put on trains from Paris to Calais, and to the Belgian, German, and Spanish frontiers, that could hold their own with anything that England and America had to show. And meanwhile the International Expresses of Prussia and Belgium jogged contentedly behind. It is true that in these two countries the track was not fit for high speeds. Nor was it at the outset in France or America. But it was possible to make it so—at least where it was in the hands of a private company. Take the latest problem of all, the electrification of main lines with dense traffic. Electric working is constantly pushing out from New York and Philadelphia, from London and Liverpool and Manchester. And, meanwhile, the Prussian Government has carried on some interesting and exhaustive experiments on a special track at Zossen.

"Railroading is a progressive science. New ideas lead to new inventions; imply new plant, new methods. And this means the spending of much new capital to be recouped by larger economies later on. The State official mistrusts ideas, pours cold water on new inventions, grudges new expenditures. No one questions the ability

of the German people. German manufacturers, German merchants, German bankers have taught the business world a good deal in recent years. German railway men have written many books, some of them valuable; but in practical operation they have taught the railway world nothing. Why? Is it because they are State officials?" [3]

There is division of opinion among labor groups as to the desirability of substituting government monopoly for private ownership with the competition which would likely continue under private operation. Samuel Gompers during his long career as president of the American Federation of Labor consistently opposed government ownership of railroads on the ground that the employees would lose the right to strike as soon as the roads were acquired by the Government. There were strikes in Hungary and in France which were lost because the Government called the men to the colors and assigned them the duty of running the railroads. There was never a strike on Prussian roads before the war, but that does not prove much, for the Government did not allow the employees so much as to organize. There was a strike on the railroads of Victoria in 1903, but it was called off in a few days because of the proposed enactment of an anti-strike law. And the law was passed in Victoria to prevent railway employees from exercising any political influence. In Italy in 1907 railway employees were made public officials and it was a criminal offense for public officials to strike against the Government. It is probable that under government operation in the United States there would be little danger of strikes, but railway employees would be constantly active in politics and would seek to attain their ends through political influ-

[3] "Historical Sketch of Government Ownership of Railroads in Foreign Countries," pp. 38-39.

ence. Some of the advocates of public ownership have replied to Mr. Gompers that there would be no necessary for strikes under government operation. If they mean by this that employees would have all their demands granted, some opponents of government ownership would see in that a very great danger, since human nature is not very different among railway employees from what it is among other groups.

Many leaders of large groups of laborers favor government operation, and pass lightly over the consequent elimination of competition. Many believe that railway labor would attain a favored position under government operation. That seems to have been the case in several countries. In a democracy it would be much easier than in an autocracy for labor to achieve a privileged position under government operation. Questions of wages, hours, and working conditions would tend to become political issues, for the employees would inevitably carry their grievances to Congress. If Congress were the final arbiter of such questions, railway employees would naturally organize as a bloc and tend to vote together in the election of federal officers. Two million employees with their families and friends might decide the average election. One careful student of American railway problems in assembling observations on government operation has published the following: "The method of the enactment of the Adamson law in 1916 provides a striking reflection of the tremendous power of organized railroad labor, and of its readiness to use that power ruthlessly to dictate government policy. The strength of political leverage would become immeasurably intensified under a nationalized railroad system, with the Government the

sole owner of the railroad properties and the sole employer of railroad labor." [4]

Another American economist said, "The passage of the Adamson eight-hour law in 1916 showed us what labor could do politically when it got the country by the throat." [5] After the congressional election in 1922, some labor organs gave labor credit for the defeat of most of the senators who had voted for the passage of the Esch-Cummins Act. If the Government should create a board to adjust wages there would be nothing to prevent the wage earners from making an appeal to Congress. Moreover, the management of government-operated roads would not be in a position to resist the demands of employees even when unreasonable. The tenure of office of government-appointed officials would not depend on whether they made the railroads pay interest on investment and give good service. There would be great temptation to secure the support of government employees by granting their demands. An able student of the relations of government and railroads has said, "A long and largely successful fight has been waged in the United States against the use by railway corporations of corrupt methods to influence or control politics. By the adoption of government ownership we should throw away all the conquests made in this field, and precipitate a new struggle against new forms of political corruption —a struggle which would probably be much longer and the ultimate issue of which would be more doubtful." [6]

No set of civil service rules could prevent men voting for their candidates nor prevent them from making ap-

[4] I. L. Sharfman, "American Railroad Problems," p. 208.
[5] F. H. Dixon, "Railroads and Government," p. 344.
[6] S. O. Dunn, "Government Ownership of Railways," p. 371.

peals to Congress when they would know that members of Congress were at their mercy.

Under private ownership and operation, railway employees bargain with the representatives of the owners. This bargaining is much freer from political influences than it could be if they were bargaining with the Government. The men understand that if they give good service it will be easier to obtain increases in wages and to retain increases after they are granted. The rank and file of employees on a privately owned railroad develop an *esprit de corp,* a morale, which would be more difficult of achievement, if one road were not striving to render better service than a competitor. On one system with a monopoly, the tendency would be to slow down to a speed below instead of near to the average, at least it seems that in the countries with government ownership the employees perform less units of service within a given time than is the case on privately owned roads within the same country. Railway employees in the United States seem to be better paid and better treated than in other countries. They perhaps will gain more as individuals under private operation than they could under government operation. The gains under government operation would likely take the form of increasing the number of employees and thereby greatly increasing the total wages bill without increasing the wages of the individual worker. There would likely be a slowing down of pace or speed at which work is done, the adoption of rules which would call for an enlarged staff, and possibly some shortening of hours. But the individual would find that his job still kept him from other employment, and that his income would tend to be rather the same through a long period of years. It is by no means certain that the individual worker would receive as much during

a year as he would under private ownership, though the wages bill of the railroads in the aggregate might be greatly increased.

As to the effect of a government monopoly upon management, it is claimed that there would be savings due to unified management such as those that might flow from a common use or rearrangement of terminals, pooling of locomotives, cars and repair shops; short routing of traffic; the withdrawal of duplicate services, especially passenger trains; abandonment of inter-railway relations permitting some reduction on accounting staff; the standardization of equipment; and the coördination of railway facilities with those of other government departments, notably the post office. As a matter of fact about all these sources of economies have already been realized. Thirty-three railway systems do more than ninety per cent of the business. Consolidation has gone forward to where there is not much more to be realized from possible economies of unification. There is as economical pooling of equipment at present as there likely could be under government operation. As for duplicate passenger trains, the public rather insists upon such service and the Government would likely maintain as expensive passenger service as is now offered, though there might be some improvement in train schedules under which all fast trains would not leave an important terminal at approximately the same hour. The Government would be a competitor of other forms of transportation and could not ignore attractiveness of service. During the War a great deal was said about the abandonment of advertising and solicitation for the purpose of diverting traffic from one road to another. That is one of the economies that is supposed to have been realized under federal control. The shipping public found that the services of

these solicitors are quite helpful in working out routings and in keeping trace of shipments. In fact shippers became very insistent that the service be restored. The effort of the Government to supply a substitute in the way of information bureaus was a conspicuous failure. Standardization of equipment has been carried about as far as is economical. Further efforts in that direction during the War, resulted in losses instead of gains. It is hard to see what desirable coördination of railway facilities with those of the post office or any other departments of the Government may not be effected under private ownership.

A source of savings is supposed to be possible in the abandonment of state and federal regulation of railroads. If the railroads were operated by the Government, it is maintained, there would be no need for the agencies of regulation. This source of saving apparently has not amounted to much in the countries where government ownership and operation is the policy. There would have to be investigations, audits, rate studies, and cost studies under government operation. The machinery would be somewhat different but it would likely be no less expensive.

Those who argue that there would be large savings under government ownership assume that management would be of as high an order as under private ownership. The men who are now operating the railroads would not relish reporting to congressional committees instead of to boards of directors. The Government in all probability would not offer as high rewards for first-rate ability as does private enterprise. Some argue that that would not be necessary, since men are glad to take much of their compensation in the form of the honor of working for the Government. While there may be something

in that contention, yet it would be difficult to persuade most men for any length of time to make the financial sacrifice necessary to stay in the government service. Even if they should be so inclined the tendency of politics to interfere and for political considerations to creep in where promotions are being considered would have the effect of making railway management less attractive under government operation. It is inconceivable that every politician who happens to rise to the presidency or to a Cabinet position would disregard political considerations in selecting men to manage railway operations. Even if the Government should pay as much as private industry it is doubtful if it could hold men who would prefer not to work in a political atmosphere. The proponents of government ownership believe that this obstacle could be overcome, and that an arrangement could be worked out under which railway management could be completely protected from political interference. While such an achievement is to be hoped for, and every encouragement should be given toward its realization, it has not yet been accomplished anywhere. What is there in American history to encourage the hope that it could soon be accomplished in this country?

At present railway operations are very closely supervised and able executives and administrators give much personal attention to the details of operation along the line of a system. That is due in part to competition and in larger measure to the fact that the roads are operated in the hope of making profits. Under government operation there would be one huge system about eight times larger than any now operating.[7] The administration would become highly centralized, subordinate officials would find it easier to take the lines of least resistance,

[7] The German system now has an aggregate of 33,000 miles.

and there would be undoubtedly a great lessening of alert and capable supervision. In the place of such supervision would come the routine and rather easy methods of the government bureau. What the English call the "government stroke" would become characteristic of the officials as well as of the most humble employees. The rules and regulations that would be set for the purchasing agents of the Government would no doubt so interfere with their bargaining power that they would not be able to get supplies on as advantageous terms as private companies. Since railroads have to purchase more than $2,000,000,000 of supplies each year a very slight weakening of bargaining effectiveness would increase the cost of these supplies by an amount greater than the proposed saving of $110,000,000 in interest on railway bonds.

In the countries that have consistently followed the policy of government ownership, it appears that the management of the railroads has lacked the initiative shown by private management. This may be due to cumbersome government regulations and it is no doubt in larger measure due to the lack of the motive to make profits. There is no particular prize to arouse incentive. Under private management as a rule if an officer fails he is removed, if he succeeds he receives recognition in the form of promotion in salary if not in position. Under government operation it is quite difficult to dismiss a man. If he fails he can usually offer some explanation more or less plausible which an easy-going bureaucracy will accept.

Again, government management of railroads would at all times be subject to the necessity of placating the politician and the railway employees. The politician would hold the whip hand over the management. The employees would feel that they could go around the man-

agement and deal with Congress directly, if the management should refuse their demands. Since they control several million votes, and in the light of what has occurred in other countries, as for example India, it would appear that the employees are not subject to as careful supervision nor to as strict discipline under government as under private operation. Management, as society and Governments are now organized, has a better chance to be effective when it is private than it has when it is public. One could say that Government should and could be better organized and directed. Would it not be wise to wait until that is accomplished before shifting from private to public ownership and operation of railroads?

Government operation in this country would impose upon management the stupendous task of operating all the railroads as one great system. There are several dangers in that proposal. First, there is no assurance that so huge a system could be efficiently operated. Second, the close supervision now given would be lost on a huge system with division headquarters all reporting to one general office. Third, there would not be the rivalry between officials on competing systems to make the best showing. It would be more difficult to stimulate the ambition and best efforts of division officers and minor officials, as railroads are now able to do. The service throughout the country might greatly deteriorate.

A distinguished advocate of government ownership and operation of railroads has listed results which he believes would follow government acquisition of the carriers.[8] Among these are getting rid of the question of valua-

[8] Joseph B. Eastman, Report of Committee on Public Ownership and Operation, Proceedings of National Association of Railroad and Utilities Commissioners, 1927.

tion, the reduction of the cost of railway capital, and better effects upon management. These effects upon management as he sees them, would be:

(1) The elimination of "the present system of duplicated management operation through the cumbersome processes of judicial procedure—which is what public regulation really is."

(2) A substitution "for private managements which more and more are becoming self-perpetuating institutions, of managements, directly responsible to a government representing all the people, and in part to non-political groups directly benefited by good management and injured by bad."

(3) A lessening of "the present danger that managements will be directly or indirectly dominated by banking or other interests which have business dealings with the utilities."

(4) An improvement of "the relations between the utilities and their employees and also the public which they serve by changing the keynote of the management from private profit to public good."

The first benefit proposed seems to be an economy which would result from the elimination of the state and federal machinery for regulation of railroads. It is true that this regulation costs a few million dollars each year. If government operation will give as good service for as little expense as does private, the saving of the cost of regulation would be a clear gain. But if there be an appreciable difference between the efficiency and general satisfaction of the two types of management, the cost of regulation would be more than offset.

The second proposed benefit contains three assumptions: (1) that private managements are becoming self-perpetuating; (2) that such a tendency is bad; (3) that

management should be responsible both to the Government and to other groups described as non-political. Before changing our policy, inquiries certainly should be made as to what is the evidence that these assumptions are true. If true, to what extent do they indicate the superiority of government operation?

The third proposed benefit seems to assume that the connection between banks and railroads is fruitful of evil. Railroads, as is the case with other business, both publicly operated and privately managed, have dealings with banks. At times the banks have large influence in shaping policy. It is probable that much of that influence would continue under government operation. Some banking houses completely dominate and control some railroads. It cannot be taken for granted that such domination and control is not beneficial to the properties concerned, and does not result in better service to the people along the lines. Occasionally a bank badly manages or even pilfers a railroad. Under private management, such offenses are limited to the mileage and properties of one of a number of railway systems. Under government operation, connivance with such a bank might bring great damage to the entire transportation system. The commission now regulates the amount of and the terms on which securities are issued. This proposed benefit seems to assume that dishonesty would be confined to private management and that no dishonest or self-serving men could have anything to do with the railroads if the Government operated them. If one were disposed to call names and to cite instances of malfeasance in public office, as startling a record could be produced as could be arranged in portraying the misdeeds of managers of private corporations. A corrupt man in a private corporation at most could injure only a few thousand miles of railway property. Such

a person in the service of the Government could injure the entire transportation machine. Moreover, banks are apt to select competent officials to direct railway operations. They have every incentive for so doing. They are likely to be much more successful in that regard than the Government would prove to be. Under the present system, the relation of banks to railroads is likely as carefully regulated as could be under any system of operation. The fourth proposed benefit seems to assume that there is a definite limit beyond which the private corporation cannot go in the relation with employees and with the general public, but that the Government may improve upon the best the corporation can do. It is suggested that this improvement in relation with employees and the public over the best a corporation could accomplish would come from directing the management from seeking profits, to seeking the public good.

The only purpose in offering a chance for profits to private capital is to serve the public good. There is the implication in the statement of this last proposed benefit that what goes to profits under private management would go to wages and to reduced rates and fares under public management. At present these profits are definitely regulated by the Commission with a view to their being merely sufficient to attract and to hold just the capital needed in the railway business. That would have to be accomplished under public management. There is no way to get the use of capital without paying for it. The amount necessary to pay would be pretty much the same regardless of whether the payment were from the public treasury or from the treasury of a private company. Public management would confront the same problem as does private management, getting the best service for the least expense. Those who scoff at the consideration which must

be given to costs under either system of management, are forgetful of the frightful burdens which negligence in that matter would speedily impose upon the public. Private management has demonstrated that railway transportation in this country can be made to pay its own way, and at the same time pay wages comparable to the favored industries, and carry goods at rates which will allow the greatest freedom of movement and a realization of the maximum benefits to be derived from a division of labor and specialization with ready exchange of goods and services. Under regulation it is practically certain that profits will not be permitted which are unreasonably high. Can government operation do more than this? Would the Government pay wages and grant privileges which would make railway employees a favored group? Would the Government cut rates below what is necessary to pay operating expenses, upkeep, and the interest on the bonds issued by the Government to purchase the railway properties? If so a subsidy would have to be levied from the general public through taxation. Who should pay the transportation bill of the country, the users of the railroads or the taxpayers? Private management has demonstrated that the users can do it and permit the Government to tax them more than a million dollars a day in addition. Under private management the public is getting satisfactory transportation service at reasonable cost; the employees are getting stable to increasing wages; and the Government is getting nearly four hundred million dollars a year in taxes. What are the specific benefits to the public and to the employees which would justify abandoning all this for what in this country would be the experiment of government operation?

Some seem to think that working for profits may be demoralizing or at least promote a tendency to gross

materialism. Wealth is merely a means to welfare. In order to have welfare, goods and services must be provided. Those who work for wages and salaries seek to contract themselves out of risk and take a specified amount of goods and services; that is, wealth as compensation for their work. They may work for the fun of it, but they could not do so long without the accompanying wages and salaries. In modern industrial society there are many risks incident to business. Somebody must assume the responsibility of paying wages and salaries to those who want a defined income or who can not themselves assume risks. In order to get these risks borne, the device of offering profits or the chance at profits has been adopted. If the risk bearer miscalculates or if unforeseen misfortune overtakes him he may suffer loss. If he manages well and escapes misfortune he may realize profits. In the profits the risk bearer gets goods and services in sufficient amount by and large to make risk bearing sufficiently attractive to supply business with competent promoters and directors. In the railway business, public regulation rather definitely defines the limits beyond which profits may not go to any appreciable extent for any great length of time. The limit is adjusted with a view to barely compensating the risk bearer; that is, just enough to keep him sufficiently interested and efficient—just to keep the wage for which he can be had.

Railroads supply a necessary service. Transportation service is a large part of the country's income. It is used with other wealth to pay the bills made necessary for welfare. Furnishing it is as much a public good as is growing wheat, packing meat, manufacturing clothes, or compounding medicines. Supplying railway transportation is creating wealth, is furnishing means to human welfare, is bringing into existence a "good" for the public con-

sumption and use. It is the same sort of good whether created under public or private management. The question is which system of management will supply the most acceptable quality of this good at the expense of the least amount of other goods.

CHAPTER XX

EFFECT UPON EXPENSES AND SERVICE

WHAT would be the effect upon the finances of the railroads of a change to government ownership? It is claimed by the advocates of government ownership and operation that there would be quite a saving in interest charges in that the Government would issue its own bonds in exchange for the bonds issued by the railroads and thereby reduce interest payments. The average rate of interest on outstanding bonds of railroads in the United States in 1925 was 4.73 per cent. Doubtless the Government in ordinary times could refund the railway indebtedness at a lower rate of interest. The rate might be as low as 3.73 per cent. Counting the railway bonds in round numbers at eleven billion dollars, that would represent a saving of $110,000,000 each year. This is assuming that the par value of the bonds would not be increased after a transfer of the railroads to the Government. It is conceivable that the Government might invoke some such doctrine as the right of eminent domain and deal rather arbitrarily with the owners of the railroads. One must bear in mind that the Government did destroy several billions of wealth by emancipating the slaves, and vast sums again through the adoption of the Eighteenth Amendment to the Constitution. If the emotions of the people could be sufficiently stirred, they might be prevailed upon to take the railroads away from their owners without due compensation. If it is assumed that the

transfer would be in accordance with constitutional and orderly processes and that it would not be attended by a revolution or revolutionary acts, an estimate can be made of the bonds the Government would have to issue in order to extinguish existing bonds and stocks.

In 1927 there were outstanding $10,887,788,386 par value of railway bonds and $7,859,252,319 par value of railway stocks, making the total capitalization $18,747,-040,705. The Government would certainly have to issue no less than that amount of bonds. In all probability it would have to issue a greater amount unless it made the rate of interest approximately equal to the average return upon stocks and bonds during a period of years, say the three or five years immediately preceding the acquisition. It is not reasonable to suppose that people who now own railway securities would readily exchange them at par for government bonds yielding about one-fourth less annual income. Since there are several billions of government bonds outstanding, these investors have evidently chosen the railway securities which carry a higher interest rate or which pay considerably more in dividends. A mere invitation by the Government to exchange them for bonds yielding a much lower rate of return would not be very appealing. An impatient advocate of government operation might say that means could be found to compel them to make the exchange on whatever terms the Government might propose. If the proposed transfer should be effected through arbitrary or revolutionary measures there is nothing to be said. If it is assumed that so important a transaction would be in accordance with the law of a law-abiding people, and that justice and equity would be sought in settling questions between groups of citizens, then the amount the Government would pay for the railroads would not be determined in a summary

fashion. It stands to reason that the owners of railroads would not care to give them up in exchange for government bonds which would yield in interest an annual sum of money less than they are accustomed to receive from their holdings. It is not to be hoped that the creditors of railroads would want bonds that would yield them a less return than they now receive. That is to say, in acquiring the railway properties, the Government would have to issue bonds in exchange for the rights of railway owners which would yield in interest a sum about equal to what such owners are accustomed to receive from their properties. The total amount of the bonds would depend upon the rate of interest. The average annual net operating income of the railroads for 1925-1927 was $1,153,000,000. If this average net operating income for the three years 1925-1927 be capitalized at 3.73 per cent it would amount to $30,911,000,000. When the decisions of the Supreme Court dealing with owners of public utility properties are read, it appears clear that the courts would sustain the claim of railway owners to bonds of the Government which would yield them in interest as much as they receive from the railroads. The more than one hundred million dollars a year which the advocates of government operation expect to save by exchanging bonds of privately owned railway companies for the bonds of the Government, after the transaction was completed would prove to have been as illusory as a mirage.

After the properties had been acquired by the Government, then it is argued that in all new construction, refunding operations or what not, which would call for additional issues of bonds, the Government would have the advantage of a lower rate of interest by reason of its superior credit, than in the case of a private company. That is assuming that the credit of the Government

would not be appreciably affected by adding to the national debt billions of dollars of bonds in acquiring the railroads of the country. All that presupposes that the Government would manage the roads successfully and that operating costs would maintain about the same relation to gross income as under private management. If the operating costs mounted in proportion to the gross revenues, if the operating ratio should go into the eighties or nineties as in Switzerland, France, Italy, and other countries after government acquisition of railroads, the credit of the Government would be tremendously affected and the advantage of a low interest rate would disappear in the face of weakening credit.

Taking for granted that government management would be as efficient as private management in maintaining gross revenues and in keeping down costs, it would be subjected to great pressure to provide no little extension of lines with no economic justification for such additions. This is a characteristic of government management. Perhaps the American people in light of the history of their political parties would have less hope of escape from political promotion of railway extension than in the case of foreign Governments. Such extensions without economic or social justification would add to the sum total of government bonds, and to the annual interest bill. Somehow, the advocates of government ownership and operation seem to think that if the railroads could be acquired by the Government, pork-barrel politics would not affect them, as it has appropriations for rivers and harbors.

Some see in the problems of railway valuation under private ownership, such difficulties as to call for government acquisition. Valuation right now is a question of great interest. The Commission in its work of regulation is required to find a valuation which it will use as a rate

base, which will guide in recapturing excess earnings and in determining the amount of stocks and bonds a railroad may issue. This work has been going on for fifteen years under the Valuation Act of 1913 and under the provisions of the Act of 1920. As the final stages of the work are approached the interest becomes intense. The Commission has announced its theories and how they have been applied. The railroads have filed their protests and have gone to the courts for a final adjudication. Within a few months or years, the Supreme Court, in some case which will reach it, will decide the issues. From then on the law should be clear and the procedure certain. Various groups are expressing concern in accordance as their interests may be affected. In any event the courts are not going to see the properties of railway owners confiscated, nor are they going to impose upon the public unfair burdens by reason of fictitious or theoretical valuations or assessments for purposes of guiding the Commission. The Commission with forty years of experience to its credit as a regulatory body will find a way to use the legal guides, in finding these arbitrary assessments or valuations, in such a way as will be fair to carriers, shippers, and the general public. While this is no place to discuss the involved issues connected with the problem of valuation, yet it may be observed that government ownership would make a valuation necessary. Before embarking upon a policy in order to get rid of the problems of valuation, which policy itself would necessitate a definite valuation, a more serious effort should be made to solve those problems under private ownership. Such an effort may reveal that the difficulties are far from being insurmountable.

Unless government operation would improve management and the organization of the railroads into less expensive or more effective agencies, not much lessening

of costs or increase in efficiency could be expected. What is there in the experience with government operation to lead one to expect superior supervision, direction, and general management under that arrangement? There are two difficulties the Government would confront: (1) a procedure adequate to select competent men; (2) conditions of appointment and employment which would hold them.

Conceding that these difficulties could be overcome, there would then be the experimentation with a huge centralized administrative machinery. Many meet with skepticism the rather sanguine promises of smooth and competent functioning of an administrative organization large enough to manage and operate all the railroads of the United States. This huge and complicated bureaucracy would certainly be subject to much congressional supervision. The dream of a wholly independent management under government ownership is not very substantial, when American history is read. Some believe that the employees would dictate to a government management instead of being coöperative and recognizing themselves under the direction of the management. Any one of these obstacles might prove to be more difficult to surmount than zealous advocates of government ownership are willing to admit. Failure to overcome any one of these very real and certain obstacles would in all probability result in increasing costs or in lowering the quality of the service, or possibly both these undesirable consequences would follow. In any event it is for the proponents of government operation to show positively that the difficulties could be met so successfully as to reduce costs or to improve service.

Government operation should have the effect of obtaining supplies for the railroads at least for no greater

cost than under private management. The railroads in this country expend about two billion dollars each year for supplies. In its building operations for post offices, customs houses, and other federal structures, it is commonly believed that the Federal Government has to pay more than private enterprise would have to pay. A variation of ten per cent above what private enterprise is able to accomplish, would add two hundred million dollars each year to the purchase price of supplies. That is in money. That says nothing about the suitability of the supplies purchased. Under private ownership there is strong incentive to get what will be best adapted to the requirements of the railroad. It is often found economical to pay more for an improved device because of the added saving after it is installed. Government bureaus are considerably bound by rules so inflexible as to be spoken of as "red tape." One reason for this is that in experimenting with new devices, some are found to be failures or not to come up to expectations. Private companies can afford to assume risks of possible disappointment, for in the end many improvements are made both in reducing costs and in rendering service. If government management selects a device which fails of the promise made, there is much criticism for "useless or unwise waste" of funds. Experimentation is necessary to progress. Yet government management is discouraged from experimenting with new machines and ideas because some of them fail, and failure brings public condemnation.

What a field for favoritism and corrupt dealing the purchase of railway supplies would afford a dishonest or unduly weak government official. Such persons occasionally work into private corporations, where their activities are limited to the scope of the particular company. What guarantee can there be that occasionally dishonest or in-

competent men would not get into positions in the government railway service where important decisions would be made? The purchase of supplies would offer a continuous temptation to such men. It is likely that in order to protect the good name of the Government against the frauds or folly of such men, a system of rules would be elaborated which by their rigidity would prevent the Government from purchasing supplies as advantageously as private companies.

How would government operation of railroads either reduce the wages bill or increase the efficiency of railway employees? There seems to be a tendency on government operated railroads for the total wages bill to increase out of proportion to the addition to the income of the individual employee. Furthermore there seems to be a decided tendency for productivity per individual laborer to decrease after government acquisition. This has in part been attributed to slackening supervision of the management and in part to the feeling of the employees that they may appeal from the management to the Legislature or to some government agency at the capital, as during Federal control, and that their status and tenure would be more or less independent of the attitude of the management.

Under private management the objective is clear cut and definite; to get the best service for the least cost. It is generally recognized that if private management succeeds in increasing revenues, through constant attention to attractive service and to the elimination of wastes, then the increased income will be divided among the shareholders in the form of dividends, the employees in wage increases, and the public in reduction of fares and freight rates. Under government operation, the objective is not so clearly defined. It is confused by much loose

talk about the public good without any clear idea as to just how the public interest is to be served. It seems that some mean, by their general assertions that government ownership would be only for the public good, that more emphasis would be placed upon the well-being of the employees. Since there are approximately two million people employed by the railroads, their welfare is of tremendous importance. If railroads pay good wages other industries are stimulated to try to do as well. Any increase in wages is to be welcomed by the community at large. Wealth is a means to welfare and for those with relatively small incomes, a slight increase brings relief from irritating denials and annoying stinting out of all proportion to the sums involved. Moreover a country's greatest asset or liability consists in the character of its citizenship. The only purpose of having railroads or any other forms of capital, is to improve the conditions under which people live. Railroads, like mines, mills, factories, farms, shops, and stores, are of no use except as they add to the sum total of services and other goods which people need and enjoy. Any contribution railroads make to the social income should result not merely in the employment of a number of people thereby affording them means of livelihood, but should also contribute to an increase in the real wages of laborers.

It would be easy to list the obvious benefits of railway transportation which have afforded employment to nearly two million persons and a livelihood for them and their families. Moreover, it could be shown that these workers and millions of others have a much greater income than wage earners received before the appearance of railroads, and much of this improvement in wages actually received, and in hours and working conditions, could be traced to the existence of fast and dependable transportation. It

must be borne in mind that this progress has taken place in this country under private operation of railroads and other lines of business endeavor. How would government operation improve the situation of railway employees? If it would result in any substantial increase in wages or other means of welfare, that in itself would be a strong argument for the change.

Railway employees have worked out a system of collective bargaining. Some groups are well organized and other groups tend to become organized. The leaders or representatives chosen by the groups to bargain with the management are, among other things, practical politicians. They look to the rank and file of their respective organizations for support and ultimately for employment, though some labor leaders are able to master their organizations and write the constitutions and by-laws so as to contribute to their desire to make the organization readily approve of the action of the representatives or leaders. These representatives, whether leaders responsive to labor union opinion or bosses able to shape and dictate opinion, must give more or less consideration to the average member. That is particularly true in working out rules governing conditions under which employment may be had and work done. A labor representative does not like to say that one member of his union is more efficient than another. He does not want to get into all the difficulties involved in appraising the merits of the individual worker. That is really the function of the management. But there is a decided tendency to resist such distinctions on the part of the management. It is urged that one man is as good as another. The slow workers resent the pace set by those with more facility. The tendency is to make seniority the most important consideration in making promotions. Private managers are continually hard put

to it to find fair and effective means of checking the tendency toward deadening mediocrity among the employees. Without their coöperation, productivity cannot be increased. Without increased productivity, the means of increasing wages are often lacking. Under government operation the management would not be under pressure to resist the tendency to mediocrity. It would be easier to yield to the demands for rules that would require more men on a job even when the presence of the additional men would not appreciably lighten the work of the others nor contribute to the efficiency of the service. One has but to read the so-called full crew laws passed by some state legislatures to see how strong is the pressure for rules which will create jobs for more men without adding to the total output or even lightening the work of men already employed. If Legislatures sometimes yield to such pressure and arbitrarily fasten such rules upon private management, is it to be supposed that public management would be permitted to resist the "make work" tendencies of labor unions, even though they could be given an incentive to do so? It seems an inevitable consequence of government operation that the personnel of the staff would be unduly and unnecessarily enlarged. This increase in the number of people employed would be so substantial as greatly to increase the total wages bill of the railroads without appreciable increase in the wages of the individual laborer. This tendency would be further accelerated by the slackening supervision and discipline which would permit a reduction in speed, in output, in production.

It is said by advocates of government ownership, that the item of taxes would be saved to railway operations under government management. The taxes paid by American railroads were $388,000,000 in 1926, a sum al-

most equal to the amount paid to the stockholders as dividends. Much of this goes to good roads and to the public schools. The educational opportunities of children in many small towns, villages, and rural communities would be greatly curtailed if taxes on the railroads serving the communities were not permissible. The total amount of money could be raised from other sources, but the present distribution of it among so many municipalities would be next to impossible.

It is sometimes said that transportation should merely pay its own way, and taxes should not be imposed which would have to be included in rates charged and to that extent impede the free movement of goods. If that should be decided to be required by the public interest, it would be a simple matter to adjust freight rates so as to yield about $375,000,000 to $400,000,000 a year less without all the bother of changing the system of ownership.

While the Government would not tax its property and taxes under government ownership would disappear from the statement of expenses, several things could happen which would have the same effect upon the railway budget as taxes would have. Among such possibilities are: the effort of the Government to earn money with which to supplement the general revenues as in Prussia before the World War; or subsidies and favors to classes of shippers, passengers, or industries as in the case of the beet sugar industry in Austria; low fares to the laboring classes as in Belgium and exceptionally low rates to wheat farmers as in western Canada. The chances are that the various local governments would lose the revenues now paid as taxes by the railroads, and the increased expenses of government operation would more than absorb the proposed saving in expenses.

In considering the effect of government ownership and operation upon the financial results from railway operations, rates and fares must be taken into account.

The proponents of government ownership contend that the adoption of their policy would lead to a reduction in the general level of rates, to a greater stability of rates, to an elimination of discrimination in rates between localities and between persons. There is nothing in the experience of other countries, as far as can be ascertained, which would indicate that the evil of personal discrimination is any more difficult to handle under private ownership than under government ownership. There are charges in all countries that certain shippers receive favors. It would seem that there would be less incentive to personal discrimination under government ownership than under private. As to discrimination between localities, under government operation such favoritism would tend to thrive even as there has been favoritism to certain sections in adjusting tariffs on imports. Public regulation of privately owned roads is effective in preventing local discriminations. Doubtless more so than if the railroads were in politics and under political management. In any event, dissatisfied people and communities could come to Congress for relief and could urge their representatives to obtain the favors they desired. As for stability of rates, it would seem that that could be achieved under either system of management. Under government operation, rates may tend to become too stable: that is, rather static, as in Germany and Belgium before the War. In New Zealand, it is complained that railway management has taken refuge in an almost inflexible system of rates and instead of modifying the rates in accordance with the changes and conditions of business, has forced business to

accommodate itself to established rates without regard to special circumstances and special needs.[1]

As for reduction of rates, experience seems to be that rates tend to increase after government acquisition, and that the rate level is ordinarily higher on government-owned roads than on the same roads when privately operated. However, there are exceptions as where Belgium kept rates for workingmen so low as hardly to pay the direct cost of operating the trains. After a government takes over a railroad the expenses of operation usually increase even though there may be no improvement in the quality of the service. This increase in expenses of operation makes it very difficult to reduce freight rates.

After a railroad is built it is assumed that service of some character will be maintained continuously. In this country a railroad may fail financially, but as a rule it is reorganized by the holders of prior liens on the property and service is maintained without interruption though it may be curtailed or modified in character. If a railroad cannot earn direct costs and something to contribute toward the indirect or constant costs of operation, it may become necessary to abandon the line. In order to do that a permit must be obtained from the Interstate Commerce Commission. Ordinarily permits for abandonment are sought for industrial tracks or short lines originally built to serve some particular interest. After this purpose has been served, there is no further use for them. Sometimes small communities may have developed along and by reason of such lines. If they are too weak to support the railroad, they usually do not suffer from the abandonment, because motor trucks on the highways are capable of meeting rather satisfactorily and economically

[1] Le Rossignol, *Quarterly Journal of Economics*, Vol. 23, p. 670, 1909.

the transportation needs of such localities which are relatively short distances from some main line of railroad.

While many main lines of railroad were built ahead of the traffic and went through long periods of hardship, yet, for the most part, they were well located and subsequent developments vindicated the judgment of the promoters. The railroads of the country are doubtless much better located to serve a variety of interests than would have been the case had the Government had much to do with the actual selection of routes. Service has not only been continuous but has been improving. In several countries the Government has been compelled to take over the railroads in order to prevent interruption if not final abandonment of service. This was true in Italy. To-day in Eastern Europe many railroads would have to be abandoned but for government support. The same is true of particular railroads on every continent, as for example the government-owned-and-operated railroad in Alaska. There is no danger that service will be interrupted on the railroads of the United States. Service will certainly be continuous under private management, assuming fair treatment.

Discrimination in service seems to be an evil which has to be guarded against under both public and private management. Under private management there has been fair success in eliminating the most objectionable forms of discrimination through regulatory measures. Under government management the form of discrimination most difficult to curb is favoritism to groups which happen to be in a position to influence the administrative policies of the Government.

In the matter of safety the record of American railroads has been criticized, though there has been improve-

ment since 1920. The safety of passengers en route seems to be rather secure. In 1922 there were 230 passengers killed, while the number of passenger miles was 35,813,000,000. The great majority of people killed and injured on railroads are trespassers, people in accidents at grade crossings, and employees. For the protection of employees, several strict laws have been enacted and large powers have been given the Interstate Commerce Commission. There are laws requiring automatic couplers, power brakes, block signals, engines which will not require the engineer to crawl under them to empty the ash pan; providing maximum hours a man may be in continuous service; and relieving employees from the hardship of the common law rules as to assumed risk and contributory negligence. Railway officials are actuated by humanitarian and financial motives to promote safety campaigns and to devise rules the observance of which would lessen accidents. Railroad officials have been quite active in obtaining legislation requiring installation of safety devices.

The causes of injuries on railroads may be summarized as follows: (1) trespassing; (2) unnecessary or unprotected highway crossings; (3) lack of proper equipment; (4) failure to enforce or to observe operating rules governing the movements of trains; (5) carelessness and recklessness due to the temper of the American people.

Is government ownership and operation necessary to remove these causes of railway fatalities and injuries? Trespassing on railway property is easy in this country because the right of way is often not fenced and tracks at and near terminals are not guarded. The reason for not fencing the right of way and guarding approaches is that much of America is sparsely settled. It is thought

that the people can be trusted to look after their own safety. In many instances the cost of preventing trespassing would be almost prohibitive.

The Government would doubtless spend more for fences, gates, and guards than private management and thereby lessen the number of casualties among trespassers. As for grade crossings, municipal governments have been entirely too generous in ordering many more crossings than are needed. State, county, and city governments have been quite careless in failing to plan highways and streets so as to reduce the number of grade crossings of railroads. With a little forethought and relatively slight expense, dangerous crossings in many instances could have been avoided. New York State has recently ordered a separation of grades at most of the important crossings. Many municipalities are likewise coöperating with the railroads in removing dangerous grade crossings. No doubt as much will be accomplished along this line under private management of the railroads as could be hoped for under public management. In the matter of equipment the carriers from time to time have hesitated or refused to make extensive investments in non-revenue producing safety devices and have been compelled to do so by regulation. Such regulation, however, has been promoted by progressive railway officials. Regulation has been effective, as much so it would seem as government operation could have been. Failure to enforce or to observe safety rules governing the movement of trains has from time to time been due to the resistance of the labor unions. That opposition would perhaps be more effective under government management.

The characteristic carelessness and recklessness of the American people is one of the inheritances from the frontier, contact with which through several generations

did much to produce the modern American. Reckless disregard of danger will gradually give way to a more cautious attitude. Government operation of railroads would contribute very little toward this evolutionary process.

Adequacy of service is a most important consideration. By adequacy is meant enough equipment and a sufficient organization to move promptly and safely any normal offering of passengers or freight. The chief causes of car shortage are: (1) insufficient motive power; (2) not enough cars; (3) ineffective utilization of cars available; (4) inadequate terminal facilities; (5) an inadequate labor force; (6) non-coöperating shippers. These are all problems of management. Would public management solve them any better than private management? The record of the past six years in this country has been so satisfactory that the traveling public and shippers are well contented with the service. Not many believe that government management could do as well. If it could do as well or better, the performance of private management leaves the public well pleased, without complaint, and even laudatory of the carriers. There is no doubt as much pooling of equipment; as free movement of equipment from one line to another; as much intelligence and fairness in apportioning cars among shippers as could be hoped for under any other system of management. There has been great progress along these lines, and much more will be accomplished. There is perhaps more adequate investment in power and cars than government operation would supply. Under government management there would be so many increases in other items of expenditure, that "economies" would likely take the form of postponement of purchases of equipment. The quality of the service under private management is certainly higher than the government could offer.

Railroad service should be supplied at as little expense as possible. One has only to turn back and read the chapter on "Performance of Railroads in the United States Since They were Returned to Their Owners" [2] in order to understand why it is that in this country there has been no demand to interfere with, or to regulate, railway management in its efforts to effect economies. The improvement has been steady, substantial, and impressive. No government management has approached the American record. It is this performance which renders the American public unresponsive to the agitators for government ownership and operation. The thoughtful citizen points to railway service which is adequate and economical and quite properly asks to be shown how he could hope for any better service at the same cost or the same quality of service at lower cost under another system of management. Considering the quality of the service, no country has equaled the United States in the economy of railway service. Some countries have lower passenger fares, but they transport people in equipment little better than our box cars. There are limits beyond which the railroads cannot go in effecting economies. A change in the character of management could not carry them beyond those limits. The limits of achievement are being approached more surely and more rapidly in the United States than in most countries, though there remains room for much improvement.

[2] Chapter XVIII, this volume, pp. 383-397.

CHAPTER XXI

POLITICS AND THE RAILROADS

Some believe that the railroads exert a pernicious influence on the politics of the country. At times and in localities this has undoubtedly been true. With the better perfecting of state and federal regulation, the opportunities for corrupting members of the Government have greatly decreased. It is difficult to see how placing the railroads under government management would take them out of politics. Political parties and political machines would continue to exist and they might find the offices in the railway organization a convenient means of rewarding faithful workers. Economic competition subject to proper regulation appears to bring great benefits to the people. The gains to be had upon substituting political for economic competition are somewhat dubious. The construction of any new line of railroad, or the extension of an existing line could become a political question, just as raising or lowering the tariff on a commodity is apt to become a political question. The "log-rolling" that obtains in connection with appropriations for rivers and harbors is notorious. What might we expect if Congress had to appropriate money for improvement and extension of railway facilities? Some believe that the wastes that would result from the construction and operation of the railroads by the Government would be far greater than the wastes now incurred through similar extravagances in waterways and public buildings. These wastes,

many observers think, would be so great that there would be no gains to divide with the shippers, travelers, and wage earners, in the form of reduced rates, improved service, and higher wages.

An American economist has laid down the following prerequisites to successful government management: [1]

(1) Able and honest administrators.
(2) Fair and humane treatment of employees.
(3) Exclusion of politics from the management.
(4) Separation of the finances of railroads from the finances of other departments of the government.
(5) An intimate connection between the railway administration and the shipping and traveling public.
(6) The development of an active and enlightened public opinion.

Taking these prerequisites up in order: private management on the whole has furnished the railroads of the United States with able and honest administrators, superior to those to be found in most countries. The advocates of government ownership do not hope to improve the quality of railway administrators nor can they prove that a larger percentage would be honest. They, as a rule, content themselves with arguing that they could get as able men. It is a fact that under private ownership they are available and are in service. As to what would be the case under government operation, it is doubtful.

Second: The rank and file of employees of the railroads of the United States are treated fairly and humanely. They are well supervised and are fairly well disciplined. Under government operation there is danger that they would either become a privileged class or that their progress would be arrested, that discipline would disappear, and that supervision would deteriorate.

Third: Under private management, American people have been rather successful in barring the railroad from politics. Under government management it would be well-

[1] Eliot Jones, "Principles of Railway Transportation," Macmillan, 1927, pp. 541-542.

nigh impossible to bar politics from the management of the railroads. Whatever the Government does is subject to review by the entire citizenship. If the Government goes into business, its business activities become subject to such review, and ordinary business transactions are inevitably made political issues. In a democracy it would be very nearly impossible to keep politics out of the management of a business which was carried on by the Government. Parties and partisanship are too strong, the temptations on the part of individual congressmen and federal officials to meddle would be too great to be resisted. Among advocates of government ownership there are a few intellectuals who believe that they could draw up a plan which would eliminate all the evils and possibilities of evil from political interference. There is no doubt about their ability to formulate a plan which would appear to meet the most ideal requirements if adopted and strictly observed as adopted. They are unduly optimistic when they assume that such a plan as they would propose could be adopted or would be observed, if once adopted. Acworth in his last years came to dream of railroads owned by the Government, and operated by competent, experienced, and wholly honest and patriotic people, who would be permitted to do their work without any interference from the branches or agencies of the Government which might act from political considerations. As ideal as that arrangement would be, no one has yet shown how it could be put into effect. While government is improving, it is far from ideal. Government has not yet reached that perfection and efficiency required to operate successfully a great railway system.

Fourth: As for keeping finances separate from the finances of other departments, that should be accomplished as is the practice in India, South Africa, and a

few other countries, though it is relatively too rare an achievement.

Fifth: The intimate connection between the railway administration and the shipping and traveling public could not be maintained as satisfactorily under government operation as under private for the very good reason that incentive would be lacking. Efforts along these lines under federal control fell far short of the accomplishments of the companies before and after public control.

Sixth: An enlightened and active public opinion would be necessary to successful government operation. If the right kind of public opinion could be developed, either system might be satisfactory. A higher degree of enlightenment and education of public opinion would appear to be necessary to keep politics from interfering with railway management than has been necessary to shut railway managers out from undue political activities.

Some argue that public regulation of railroads is a confession of the failure of private management. This suggests to the mind many failures. Marriage is hedged about by laws and conventions. Private ownership of residences is subjected to laws and ordinances. All sorts of relationships result in contracts which are subject to interpretation and enforcement by the courts. Some believe that a Commission created to regulate might as well go ahead and operate railroads. A commission may be quite competent to decide the relatively few questions that are brought to it for final determination, and yet be wholly incompetent to manage and operate a railroad. Settling a controversy is very different from conducting a business. The Interstate Commerce Commission with a staff of trained clerks, accountants, statisticians, economists, engineers, and lawyers, each year disposes of a few thousand questions, the majority of them being

handled informally. If called upon to manage the railroads it would at once be confronted by millions of questions the answer to each of which would affect the quality and cost of service. The technique required of a government official is quite different from that required of a railway official. Operating trains is quite different from adjudicating lawsuits. Maintaining every mile of railroad, looking after the condition of every freight and passenger car, determining the task and the compensation of every railway employee, receiving and discharging every pound of freight, is all very different from determining whether or not a particular railroad has violated the ash-pan act. One of the most prominent as well as one of the most competent advocates of government ownership of railroads has decided that the question should be limited to new enterprises of the future. In closing an address he said: [2]

> There remains the question, however, whether an attempt should be made to establish such a policy in the case of those railroads and public utilities which now exist and are privately operated under public regulation. It seems to me that there are many practical aspects to this question which merit consideration.
>
> In the first place, any radical, extensive, and sudden change in present conditions is dangerous unless proper preparations have been made for such a change and it is supported by public opinion. I question whether public opinion is now prepared to support a wholesale conversion of our railroads and utilities to the public ownership and operation, and I am quite certain that adequate preparations for such a step have not been made and probably could not be made under present conditions.
>
> In the second place, until the courts have more definitely indicated their views upon the valuation question, such a step

[2] Joseph B. Eastman, Report of Committee on Public Ownership and Operations, 1927. National Association of Railroad and Utilities Commissioners.

would be attended by the danger that it would involve the payment of a price either for the physical properties or for the stocks of the private corporations, so out of reason that it would condemn the new policy to comparative failure for some years to come.

Without further elaborating such considerations, I am persuaded that the policy of public ownership and operation must await gradual development under the slow processes of evolution. It can and should be adopted for the future, and from time to time circumstances will arise in the case of particular existing properties which will make possible the adoption of the new policy under comparatively favorable conditions. In the meantime we, as public officials entrusted with the duty of regulating private operation, ought to do everything in our power to make the present system work as successfully as possible to the public advantage, at the same time preparing ourselves by unremitting study of the situation for any eventualities that the future may hold forth.

This is a most conservative statement. If all advocates of government ownership and operation were equally temperate and judicious there would be little to fear from the agitation. The radical who refuses to analyze the present situation and who is impatient for precipitate change may prove to be a cause for concern. Such men occasionally sit in high places and are skillful in turning some stirring incident or series of misfortunes to serve their cause.

APPENDIX

LATVIA, ESTONIA, AND FINLAND

In Latvia there are 1715 miles of railroad, all of which are owned by the Government, with the exception of two short

RAILROADS OF LATVIA

For the Year Ending March 31, 1925

Item	State System
Average miles operated	1,615
Employees and equipment:	
Number of employees	16,641
Number of locomotives	330
Number of passenger cars	597
Number of freight cars	5,503
Services:	
Passengers carried—all classes	11,412,789
Passengers carried—first class	11,725
Tons of freight carried	2,195,545
Tons of freight carried one mile	178,966,928
Train miles	3,129,609
Locomotive miles	4,246,753
Results of operation:	
Operating revenues	$6,249,328
Operating expenses	5,379,925
Net operating revenue	869,403
Operating ratio—per cent	86.09
Charges:	
Passenger revenues	2,379,757
Average receipts per passenger—all classes	0.21
Average receipts per passenger mile—all classes	0.671¢
Freight revenue	2,788,725
Average receipts per ton mile	1.558¢

Source: Bulletin de l'Union Internationale des Chemins de Fer, June, 1927.

lines of minor importance of only 100 miles.[1] Half of the lines are broad gauge and the remainder is divided among four

[1] No data are available regarding the two private companies.

Railroads of Latvia, Estonia, and Finland

other gauges. The equipment of the Latvian railroads is for the most part of old construction and of different types. The passenger cars are of two classes and their number does not

RAILROADS OF ESTONIA

For the Year Ending December 31, 1925

Item	State System
Average miles operated	691
Employees and equipment:	
Number of employees	4,607
Number of locomotives	203
Number of passenger cars	441
Number of freight cars	5,112
Services:	
Passengers carried—all classes	6,052,000
Tons of freight carried	1,880,541
Tons of freight carried one mile	73,438,829
Train miles	2,129,777
Locomotive miles	2,883,299
Results of operation:	
Operating revenues	$3,218,252
Operating expenses	3,026,616
Net operating revenue	191,636
Operating ratio—per cent	94.05
Charges:	
Passenger revenues	1,170,608
Average receipts per passenger—all classes	0.79
Freight revenue	1,961,083
Average receipts per ton mile	2.670¢

Sources: Bulletin de l'Union Internationale des Chemins de Fer, August and September, 1927. Commerce Reports, U. S. Department of Commerce.

meet the needs of the passenger traffic. Passengers for inland points are frequently transported in freight cars.

The railroads of Estonia are owned by the Government, of which 448 miles are standard gauge and 363 miles are narrow gauge.

In Finland the Government owns 2820 miles of railroads and private companies own 165 miles, which are for the most part industrial tracks.

Loans for railway construction are negotiated and handled by the Government.

RAILROADS OF FINLAND

For the Year Ending December 31, 1925

Item	State System
Average miles operated	2,766
Capitalization or cost of construction	$128,219,339
Capitalization or cost of construction per mile	46,355
Employees and equipment:	
Number of employees	25,214
Number of locomotives	659
Number of passenger cars	1,158
Number of freight cars	16,728
Services:	
Passengers carried—all classes	22,104,352
Passengers carried—first class	5,214
Tons of freight carried	9,835,982
Tons of freight carried one mile	987,799,140
Train miles	11,181,004
Locomotive miles	18,091,750
Results of operation:	
Operating revenues	$18,300,854
Operating expenses	14,610,137
Net operating revenue	3,690,717
Operating ratio—per cent	79.83
Charges:	
Passenger revenues	5,862,754
Average receipts per passenger—all classes	0.27
Average receipts per passenger—first class	3.98
Average receipts per passenger mile—all classes	1.039¢
Freight revenue	11,696,723
Average receipts per ton mile	1.184¢

Source: Rautatiehallituksen Kertomus Vnodeltd, 1925.

GREECE

The railway mileage of Greece is less than that of the island of Cuba. The financial operations are not satisfactory. It seems that it is necessary for the State to undertake the financial burden of railway operation, in order to assure continued service.

Railroads of Greece

RAILROADS OF GREECE

For the Year Ending March 31, 1926

Item	State System
Average miles operated	779
Employees and equipment:	
Number of employees	7,648
Number of locomotives	146
Number of passenger cars	272
Number of freight cars	2,716
Services:	
Passengers carried—all classes	3,840,503
Passengers carried—first class	147,518
Tons of freight carried	1,297,721
Tons of freight carried one mile	75,805,177
Locomotive miles	2,956,588

RAILROADS OF GREECE—*Continued*

Results of operation:	
Operating revenues [a]	{$50,576,788 { 4,091,741
Operating expenses [a]	{ 48,260,684 { 3,904,364
Net operating revenue [a]	{ 2,316,104 { 187,377
Operating ratio—per cent	95.42
Charges:	
Passenger revenues [a]	{ 22,543,730 { 1,823,823
Average receipts per passenger—all classes [a]	{5.87 {0.47
Freight revenue [a]	{ 23,455,264 { 1,897,567
Average receipts per ton mile [a]	{30.942¢ { 2.503¢

[a] Computed at both normal and average rate of exchange. The upper and larger figure is at the normal rate of 19.3¢ per drachma, while the lower and smaller figure is at the rate of 1.5614¢ per drachma, which was the average rate of exchange prevailing during the year 1925.

Source: Archiv für Eisenbahnwesen, January and February, 1928.

RAILROADS OF SIAM

For the Year Ending March 31, 1926

Item	State System
Average miles operated	1,604
Capitalization or cost of construction	$59,335,498
Capitalization or cost of construction per mile	36,992
Employees and equipment:	
Number of employees	13,991
Number of locomotives	143
Number of passenger cars	340
Number of freight cars	2,427
Services:	
Passengers carried—all classes	6,006,772
Passengers carried—first class	19,316
Tons of freight carried	1,300,318
Train miles	3,076,897
Results of operation:	
Operating revenues	$ 5,976,259
Operating expenses	2,342,200
Net operating revenue	3,634,059
Operating ratio—per cent	39.19
Charges:	
Passenger revenues	$ 2,631,578
Average receipts per passenger—all classes	0.44
Average receipts per passenger—first class	4.88
Freight revenue	437,407

Source: Annual Report of the Royal State Railways of Siam for the year, Buddhist Era, 2468.

RAILROADS OF JAMAICA

For the Year Ending December 31, 1926

Item	State System
Average miles operated	210
Capitalization or cost of construction	$17,208,713
Capitalization or cost of construction per mile	81,946
Equipment:	
Number of locomotives	44
Number of passenger cars	33
Number of freight cars	538
Services:	
Passengers carried—all classes	620,328
Tons of freight carried	382,164
Tons of freight carried one mile	12,679,638
Train miles	495,760
Locomotive miles	663,504
Results of operations:	
Operating revenues	$ 1,729,432
Operating expenses	1,359,374
Net operating revenue	370,058
Operating ratio—per cent	78.60
Charges:	
Passenger revenues	$ 313,417
Average receipts per passenger—all classes	0.51
Freight revenue	1,238,359
Average receipts per ton mile	9.342¢

Source: Annual Report of the Jamaica Government Railway for the Year ended December 31, 1926.

RAILROADS OF THE WEST INDIES

	Miles
Cuba	
United Railway System	1,941
Hershey Cuban Railway	76
Guantanamo and Western Railroad Co	90
Cuba Northern Railroad	192
Habana Electric Railway, Light & Power Co	96
Tunas Sancti-Spiritus Railroad	25
Cienfuegos, Palmira & Cruces Railway	24
Guantanamo Railroad	72
Cuba Railroad	856
Total	3,372
Dominican Republic	
Central Dominican Railroad	62
Samana-Santiago Railroad	97
Total	159
Barbados	
Barbados Railroad	24
Jamaica	
Jamaica Railway	200
Porto Rica	
American Railroad Company of Porto Rica	222
Ponce and Guayama Railroad Co	48
Total	270
Trinidad	
Trinidad Government Railway	116
Haiti	
National Railway Company of Haiti	110

RAILROADS OF ALASKA

For the Year Ending June 30, 1926

Item	State System
Average miles operated	544
Capitalization or cost of construction	$62,531,147
Capitalization or cost of construction per mile	114,947
Number of employees	980
Services:	
Passengers carried—all classes	57,567
Tons of freight carried	65,036
Tons of freight carried one mile	12,240,225
Train miles	237,319
Locomotive miles	316,397
Results of operation:	
Operating revenues	$ 978,704
Operating expenses	1,862,495
Net operating revenue	def. 883,791
Operating ratio—per cent	190.30
Charges:	
Passenger revenues	196,795
Average receipts per passenger—all classes	3.42
Average receipts per passenger mile—all classes	5.614¢
Freight revenue	559,614
Average receipts per ton mile	4.572¢

Source: Annual Report of the Secretary of the Interior, Fiscal Year 1926.

RAILROADS OF HAWAII

For the Year Ending December 31, 1925

Item	Private Railroads
Average miles operated	240
Capitalization or cost of construction	$13,049,274
Capitalization or cost of construction per mile	54,372
Equipment:	
Number of locomotives	49
Number of passenger cars	96
Number of freight cars	1,390
Services:	
Passengers carried—all classes	1,461,976
Tons of freight carried	1,670,219
Tons of freight carried one mile	32,036,170
Train miles	781,245
Locomotive miles	876,040
Results of operation:	
Operating revenues	$ 3,534,734
Operating expenses	2,278,471
Net operating revenue	1,256,263
Operating ratio—per cent	64.46
Charges:	
Passenger revenues	333,494
Average receipts per passenger—all classes	0.23
Average receipts per passenger mile—all classes	2.257¢
Freight revenue	2,881,778
Average receipts per ton mile	8.995¢
Taxes	344,886

Source: Annual Report of the Public Utilities Commission of Hawaii.

RAILROADS OF THE PHILIPPINES

For the Year Ending December 31, 1926

Item	Manila Railway	Philippine Railway
Average miles operated	659	132
Capitalization or cost of construction	$28,649,000	$17,637,836
Capitalization or cost of construction per mile	43,473	133,620
Employees and equipment:		
Number of employees	6,348	.....
Number of locomotives	147	16
Number of passenger cars	249	52
Number of freight cars	1,820	233
Services:		
Passengers carried—all classes	8,357,087	1,648,444
Tons of freight carried	1,609,106	275,105
Tons of freight carried one mile	94,415,459	6,097,354
Locomotive miles	2,155,673	391,150
Results of operation:		
Operating revenues	$ 6,326,200	$ 666,643
Operating expenses	3,847,132	511,209
Net operating revenue	2,479,068	155,434
Operating ratio—per cent	60.81	76.68
Charges:		
Passenger revenues	2,795,095	304,756
Average receipts per passenger—all classes	0.34	0.18
Average receipts per passenger mile—all classes	1.786¢	1.304¢
Freight revenue	2,849,098	310,042
Average receipts per ton mile	3.018¢	5.095¢
Taxes	69,378	3,664

Source: Report of the General Manager of the Manila Railway Company, 1926. Annual Report of Philippine Railway Company, 1926.

RAILWAY MILEAGE OF THE WORLD

1924 and 1925

(Source: Archiv für Eisenbahnwesen, January and February, 1928)

Continent and Country	Miles of Line at End of Year		Area (sq. miles)	Population (Number)	Miles of Line in 1925 per	
	1924	1925			100 square miles of area	10,000 population
NORTH AMERICA:						
Antigua	20	20	116	29,000	17.2	6.9
Bahama Islands	10	28	4,402	53,000	0.6	5.3
Canada	40,093	40,093	3,729,732	9,364,000	1.1	42.8
Costa Rica	667	667	18,764	507,000	3.6	13.2
Cuba	3,723	3,723	44,209	3,123,000	8.4	11.9
Dominican Republic	408	408	19,344	895,000	2.1	4.6
Guatemala	685	685	42,355	2,005,000	1.6	3.4
Haiti	173	210	11,081	2,028,000	1.9	1.0
Honduras	812	812	59,575	760,000	1.4	10.7
Jamaica	200	205	4,208	858,000	4.9	2.4
Martinique	186	186	386	244,000	48.2	7.6
Mexico	16,445	16,443	757,607	14,281,000	2.2	11.5
Newfoundland	953	953	162,934	263,000	0.6	36.2
Nicaragua	200	200	49,151	638,000	0.4	3.1
Panama	469	469	28,764	446,000	1.6	10.5
Porto Rico	340	340	3,436	1,403,000	9.9	2.4
St. Kitts	16	16	77	22,000	20.8	7.3
Salvador	256	256	13,166	1,582,000	1.9	1.6
United States (incl. Alaska)	250,966	250,900	3,625,099	106,139,000	6.9	23.6
Virgin Islands	30	30	77	5,000	39.0	60.0
Total—N. America	316,652	316,644	8,574,483	144,645,000	3.7	21.9
SOUTH AMERICA:						
Argentina	23,482	23,482	1,150,039	9,847,000	2.0	23.8
Barbados	24	498	154	159,000	323.4	31.3
Bolivia	1,502	1,502	613,977	2,990,000	0.2	5.0
Brazil	18,704	18,951	3,286,180	33,767,000	0.6	5.6
British Guiana	104	104	89,460	298,000	0.1	3.5
Chile	5,382	5,382	290,155	3,754,000	1.9	14.3
Colombia	1,020	1,108	495,522	5,855,000	0.2	1.9
Dutch Guiana	37	107	54,324	136,000	0.2	7.9
Ecuador	652	652	224,209	2,000,000	0.3	3.3
Paraguay	309	517	171,815	1,000,000	0.3	5.2
Peru	2,075	2,089	523,166	5,550,000	0.4	3.8
Trinidad	173	173	1,969	382,000	8.8	4.5
Uruguay	1,659	1,659	72,162	1,640,000	2.3	10.1
Venezuela	660	660	393,977	2,533,000	0.2	2.6
Total—S. America	55,783	56,884	7,367,109	69,911,000	0.8	8.1

[1] Bureau of Railway Economics, Washington, D. C., March 2, 1928.

RAILWAY MILEAGE OF THE WORLD—*Continued*

Continent and Country	Miles of Line at End of Year		Area (sq. miles)	Population (Number)	Miles of Line in 1925 per	
	1924	1925			100 square miles of area	10,000 population
AFRICA:						
Abyssinia	495	495	8,494	65,000	5.8	76.2
Algiers and Tunis.	4,220	4,834	270,502	8,159,000	1.8	5.9
Angola	818	818	484,865	4,182,000	0.2	2.0
Bechuanaland	425	425	275,058	153,000	0.2	27.8
Belgian Congo Colony	1,273	1,273	920,889	7,153,000	0.1	1.8
British Central Africa (Nyasaland)	174	174	39,962	1,212,000	0.4	1.4
British East Africa (incl. Zanzibar)	693	693	431,969	5,945,000	0.2	1.2
Egypt (incl. Sudan)	4,894	4,894	1,361,005	19,949,000	0.4	2.5
Equatorial Africa	336	336	871,004	2,851,000	0.04	1.2
French West Africa	1,714	2,070	1,853,283	12,283,000	0.1	1.7
Gold Coast	302	302	78,610	2,108,000	0.4	1.4
Kamerum	283	283	166,525	3,000,000	0.2	0.9
Madagascar	600	600	242,201	3,382,000	0.2	1.8
Mauritius	144	144	734	377,000	19.6	3.8
Morocco	885	885	160,232	4,330,000	0.6	2.0
Mozembique	521	572	294,981	3,120,000	0.2	1.8
Nigeria	1,126	1,126	336,062	18,071,000	0.3	0.6
Réunion	79	79	927	173,000	8.5	4.6
Rhodesia	2,470	2,470	440,155	2,011,000	0.6	12.3
Sierra Leone	355	355	30,888	1,541,000	1.1	2.3
Southwest Africa	1,680	1,680	322,433	228,000	0.5	73.7
Tanganyika	1,019	1,022	365,097	4,124,000	0.3	2.5
Togoland	206	206	20,077	671,000	1.0	3.1
Union of S. Africa	11,745	11,745	472,355	7,294,000	2.5	16.1
Total—Africa	36,457	37,481	9,448,308	112,382,000	0.4	3.3
ASIA:						
Asia Minor, Syria and Arabia (incl. Cyprus)	3,829	3,829	1,418,225	21,311,000	0.3	1.8
British East Indies	38,068	38,571	1,892,627	319,647,000	2.0	1.2
Ceylon	733	733	25,328	4,505,000	2.9	1.6
China	7,173	7,469	4,370,659	441,200,000	0.2	0.2
Cochin China, Cambodia, Annan, Tonking	1,490	1,490	270,579	19,844,000	0.6	0.8
Dutch East Indies (India, Java, and Sumatra)	1,895	2,971	788,340	49,543,000	0.4	0.6
Japan (incl. Korea, Formosa, and Kuangtung)	13,110	14,032	262,433	84,567,000	5.3	1.7
Malay States	1,163	1,163	51,004	2,448,000	2.3	4.8
North Borneo, Sarawak	140	140	78,958	889,000	0.2	1.6
Palestine	696	696	8,996	757,000	7.7	9.2
Persia	350	135	628,186	10,000,000	0.02	0.1
Philippines	810	810	115,019	11,414,000	0.7	0.7
Pondichéry	59	59	116	175,000	50.9	3.4
Portuguese India	54	57	1,622	579,000	3.5	1.0
Russia (Asiatic)	10,184	10,550	6,191,123	30,712,000	0.2	3.4
Siam	1,539	1,547	200,077	9,724,000	0.8	1.6
Total—Asia	81,293	84,252	16,303,292	1,007,315,000	0.5	0.8

RAILWAY MILEAGE OF THE WORLD—*Continued*

Continent and Country	Miles of Line at End of Year		Area (sq. miles)	Population (Number)	Miles of Line in 1925 per	
	1924	1925			100 square miles of area	10,000 population
AUSTRALIA:						
Canberra Federal District	5	5	927	4,000	0.5	12.5
Hawaii (incl. Maui and Oahu)	243	252	6,448	292,000	3.9	8.6
New Caledonia	19	19	7,220	48,000	0.3	4.0
New South Wales	5,654	5,654	309,421	2,272,000	1.8	24.9
New Zealand	3,084	3,200	103,900	1,426,000	3.1	22.4
Northern Territory	199	199	523,630	4,000	0.04	497.5
Queensland	7,067	7,067	670,464	855,000	1.1	82.7
South Australia	3,488	3,488	380,077	543,000	0.9	64.2
Tasmania	873	873	26,216	212,000	3.3	41.2
Victoria	4,483	4,483	87,876	1,671,000	5.1	26.8
Western Australia	4,870	4,870	975,908	368,000	0.5	132.3
Total—Australia	29,985	30,110	3,092,087	7,695,000	1.0	39.1
EUROPE:						
Albania	186	186	10,618	804,000	1.8	2.3
Austria	4,373	4,373	32,355	6,535,000	13.5	6.7
Belgium	6,893	6,893	11,737	7,812,000	58.7	8.8
Bulgaria	1,624	1,639	39,807	5,483,000	4.1	3.0
Czechoslovakia	8,718	8,718	54,209	13,613,000	16.1	6.4
Denmark	3,096	3,148	16,602	3,420,000	19.0	9.2
Estonia	890	890	18,340	1,107,000	4.9	8.0
Finland	2,821	2,821	150,000	3,365,000	1.9	8.4
France	33,284	33,284	212,741	44,744,000	15.6	7.4
Germany	36,028	36,136	182,240	63,184,000	19.8	5.7
Great Britain	24,396	24,396	94,209	45,213,000	25.9	5.4
Greece	1,983	1,983	49,035	5,022,000	4.0	3.9
Hungary	5,922	5,922	35,869	8,275,000	16.5	7.2
Italy	12,840	13,110	119,653	38,756,000	11.0	3.4
Jugoslavia	5,699	6,118	96,023	11,997,000	6.4	5.1
Latvia	1,755	1,775	25,405	1,845,000	7.0	9.6
Lithuania	1,939	1,939	21,583	2,371,000	9.0	8.2
Luxemburg	334	342	1,004	267,000	34.1	12.8
Malta, Jersey, Man	68	68	425	375,000	16.0	1.8
Netherlands	2,265	2,265	13,205	6,865,000	17.2	3.3
Norway	2,147	2,230	125,019	2,732,000	1.8	8.2
Poland	11,974	12,054	149,961	27,177,000	8.0	4.4
Portugal	2,129	2,129	35,483	6,033,000	6.0	3.5
Rumania	7,322	7,424	113,591	17,500,000	6.5	4.2
Russia (European)	35,708	35,739	2,240,542	115,508,000	1.6	3.1
Spain	9,676	9,676	195,058	21,967,000	5.0	4.4
Sweden	9,765	9,765	173,166	6,006,000	5.6	16.3
Switzerland	3,572	3,587	15,946	3,918,000	22.5	9.2
Turkey	257	257	10,425	1,000,000	2.5	2.6
Total—Europe	237,664	238,867	4,244,251	472,894,000	5.6	5.1
RECAPITULATION:						
North America	316,652	316,644	8,574,483	144,645,000	3.7	21.9
South America	55,783	56,884	7,367,109	69,911,000	0.8	8.1
Africa	36,457	37,481	9,448,308	112,382,000	0.4	3.3
Asia	81,293	84,252	16,303,292	1,007,315,000	0.5	0.8
Australia	29,985	30,110	3,092,087	7,695,000	1.0	39.1
Europe	237,664	238,867	4,244,251	472,894,000	5.6	5.1
Total—World	757,834	764,238	49,029,530	1,814,842,000	1.6	4.2

THE TRANS-SIBERIAN RAILROAD

Shortly after the middle of the nineteenth century, Russia began to consider the desirability and feasability of a railroad from Russia in Europe, through Siberia, to the Pacific port of Vladivostok. In 1891 it was reported that European capital was unfriendly to the scheme due to the probable changes in transportation routes and distributing centers that would result. The Imperial Government of Russia could not risk the losses which, without such communication, it would sustain in case of war. Accordingly the railroad was built with state funds and construction was started from both ends in 1891.

The plans called for single track light construction. The bridges, however, particularly over the four important rivers of Siberia, were well built with the idea that they would be permanent. Construction was very difficult, for the work possible in the short, hot summers was lessened by rain, frequent Russian holidays, shortages of labor and materials, scarcity of good water, and abundance of brackish streams making necessary numerous temporary bridges.

From a commercial point of view it was not expected that the road would be of importance in its transcontinental, through-traffic aspect. It was hoped that the road would open up parts of Siberia to settlement and it was recognized that passenger traffic between Europe and the Far East might be important. With a speed of only twenty miles an hour by train, goods could be moved from and to London and western European points more quickly than by ships going by way of the Suez Canal. When the West Siberian Railway was opened to regular traffic in 1896 it was impossible to accommodate all the goods and passengers applying for transportation. During the next three years thirty-one sidings were added and the equipment was greatly increased. The railroad was heralded as a commercial success.

The original plan of the Trans-Siberian road east of Chita contemplated construction to the north, around Manchuria, and then south to Vladivostok. In 1895 the Chinese Government, after the Chino-Japanese War, accorded, as a token of gratitude to Russia for her share in the combined intervention

Trans-Siberian Railroad and Connecting Lines

with France and Germany in her favor, the privilege of building a railroad through Manchuria to Vladivostok. Furthermore, Russia was allowed to occupy the country adjacent to the railroad during the period of construction, in order better to protect works and workmen. This new route shortened the distance to Vladivostok by several hundred miles, as well as reduced the difficulties of construction. Russia, however, was not yet satisfied and in a few years had received permission to build an extension to Port Arthur. This road through Manchuria is known as the Chinese Eastern and has played an important rôle in international politics.

Lake Baikal, a huge fresh water sea, lay across the path of the railroad and the territory surrounding it presented such great technical difficulties in railway construction that the

builders turned to train ferries as a solution. Two huge ferries were built in England and assembled on the shores of Lake Baikal. These took the form of ice breakers, a task they were called on to perform the greater part of the year. When the ice reached a thickness too great for them to cut through, passengers and goods were transported across the lake on sleds.

During the war between Russia and Japan in 1904, the railroad performed valuable services for Russia. It was necessary to add two hundred sidings and to rush through the branch of one hundred and twenty-five miles around Lake Baikal in spite of obstacles. As a result of the war Russia lost control of the branch to Port Arthur beyond Changchun. Nevertheless it may be assumed that her defeat would have been much greater but for the Trans-Siberian. Soon after that war, a program of double-tracking was entered upon. In 1911 it was said that the total cost of the main line, exclusive of equipment, amounted to nearly two hundred million dollars.

The reported history of the road during the last ten years is very scrappy and inadequate. In 1917 the Stevens Commission reported in favor of sending what was later to be known as the Russian Railway Service Corps to Asia to reorganize the Trans-Siberian road to allow the shipment of ammunition across Asia. In December, 1917, 216 men reached Asia but found the Bolsheviks holding Vladivostok. The corps took refuge in Japan after being turned away from the Russian port. In March half the corps went to China to take charge of the Chinese Eastern. During the spring and summer the Czecks defeated the Bolsheviks, and the remainder of the corps returned to Vladivostok with the intention of coöperating with the Omsk Government then in power. After the Armistice the Allies formed a committee, including a member of each of the following nationalities: Russian, Chinese, Japanese, American, British, French, and Italian. Their purpose was the restoration of the efficiency of the Trans-Siberian, including the Chinese Eastern. Men of several nationalities were scattered along the line, but their achievements were not outstanding. The Bolsheviks started across Siberia again, the Omsk Government under Kolchak was forced to flee, and reorganization of the Trans-Siberian by the Interallied Committee became impossible.

During the last two or three years varied reports have come through concerning the conditions of travel on the Trans-Siberian. That through service has been established and that the Soviet Government, after breaking its agreement with the Wagon-Lits Company, runs its own sleeping-car service, is known. Little else that is dependable can be gleaned from the scanty material at hand.

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